C100 HDS

Installation Manual

Solid State Logic

SOUND || VISION

C100 HDS

DIGITAL BROADCAST CONSOLE

Installation Manual

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Solid State Logic

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E&OE

C100 HDS Installation Manual

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About This Manual

This manual aims to provide all the information that may be necessary to enable clients to prepare and then install the C100 HDS console, Blackrock™ processor and remote I/O systems.

This manual is divided into four sections as follows:

Section 1 **Introduction** – *This section*. Please take time to read this section fully as it includes important information relating to electrical and to physical ***safety***.

Section 2 **Preparation** – Covers the requirements for the intended location of the room/studio and then lists the peripheral equipment that will be needed. Note that some items and services will need to be supplied by the facility. This section also provides an overview with more detailed descriptions of the main component parts of the C100 HDS system.

Section 3 **Installation** – Provides detailed cabling instructions of each system element and includes an overview of the initial setup of the system network.

Section 4 **Appendices** – These include: Specifications, connector pinouts, configuration details and useful guidelines. Also covered are options that include: Additional I/O, resource sharing capability and processor redundancy.

The information provided by this manual is relevant to the all versions of the C100 HDS. Any aspects of the C100HDS system which may be subject to specific customisation – Master Channel layout and meter panel as examples – will be documented separately and supplied with the console.

Symbols Used Throughout This Manual

Electrical safety hazard.

General safety warning.

Important, useful or otherwise noteworthy information will be indicated with a ruled line above and below.

Indicates that additional information may be located on another page or in an Appendix.

Contacting SSL

For all general enquiries about installation please contact your local SSL representative.

For support or training enquiries contact: Customer Support: support@solidstatelogic.com

Additional Reading.

This manual includes console operational information that will be of use during the console's initial configuration. More extensive console operational information will be found in the separate Operator's Reference Manual.

SSL also provide extensive on-site training for their consoles; if this is of interest, please contact customer support at the address shown above.

Safety Information

This section contains definitions and warnings, and practical information to ensure a safe working environment. Please take time to read this section before undertaking any installation work.

Definitions

'Maintenance'

All maintenance must be carried out by fully trained personnel. Note: It is advisable to observe suitable ESD precautions when maintaining electronic assemblies.

'Non-User Adjustments'

Adjustments or alterations to the equipment may affect the performance such that safety and/or international compliance standards may no longer be met. Any such adjustments must therefore only be carried out by fully trained personnel.

'Users'

This equipment is designed for use solely by engineers and competent operators skilled in the use of professional audio equipment.

'Environment'

This product is a class A product intended to form an integrated component part of a professional audio recording, mixing, TV, radio broadcast or similar studio wherein it will perform to specification providing that it is installed according to professional practice.

Safety Earth Connection

Any mains powered item of SSL equipment that is supplied with a 3-core mains lead (whether connectorised or not) must always have the earth wire connected to the mains supply ground AND PRECAUTIONS SHOULD BE MADE SO THAT THE GROUNDING IS NOT DEFEATED. This is the safety earth and grounds the exposed metal parts of the racks and enclosures and must not be removed for any reason.

ALL MAINS CORDS SUPPLIED ARE FITTED WITH AN IEC 60320 C13 TYPE SOCKET. WHEN CONNECTING TO SUPPLY OUTLETS ENSURE THAT APPROPRIATE SIZED CONDUCTORS AND PLUGS ARE USED TO SUIT LOCAL ELECTRICAL REQUIREMENTS.

Mains Supply and Phases

To ensure safe operation of this equipment, connect only to an AC power source that contains a protective earthing (PE) conductor. This equipment is designed for connection to single phase supplies with the neutral conductor at earth potential – category TN or TT – and is fitted with a protective fuse in the live conductor only. This equipment is not designed for use with live and neutral connections reversed or where the neutral conductor is not at earth potential (IT supplies). This equipment should not be connected to a power system that switches open the return (neutral) lead when the return lead also functions as the protective earth (PE).

All mains powered assemblies must be connected to the same mains phase. In particular, note that as PSU redundancy is standard, the two input leads must NOT be connected across different phases of a 3-phase supply.

Mains cables will be coded with either of the following colour schemes:

	1	or	**2**
LIVE:	Brown		Black
NEUTRAL:	Blue		White
EARTH:	Yellow/Green		Green

The ratings label, which details the console power requirements, is located adjacent to the mains inlet connectors on the power input panel beneath the rear of the console.

Mains Isolation and Over-Current Protection

An external disconnect device is required for this equipment which must be installed according to current wiring regulations. A detachable power cord, as fitted to this equipment, is a suitable disconnect device.

An external over-current protection device is required to protect the wiring to this equipment which must be installed according to the current wiring regulations. The fusing or breaking-current is defined in the product specification. In certain countries this function is supplied by use of a fused plug.

Some units (specifically, those fitted with PSU Redundancy) utilise multiple power sources. This is clearly marked on the equipment. The finished installation must also be clearly marked to ensure that all sources of power are removed before servicing work begins.

Physical Safety

The console surface is too heavy for one person to move; ensure sufficient manpower is available when positioning the console. Take particular care if removing a fully populated RIO chassis from an equipment rack.

If the console trim is removed for any reason then there may be sharp edges exposed on the frame metalwork.

Regulatory Information

CE Certification

The C100 HDS system is CE compliant. Note that cables supplied with SSL equipment may be fitted with ferrite rings at each end. This is to comply with the current regulations and these ferrites should not be removed.

If any of the console metalwork is modified in any way – particularly the addition of holes for custom switches etc. – this may the adversely affect the CE certification status of the product.

FCC Certification

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Instructions for Disposal of WEEE by Users in the European Union

The symbol shown here, which is on the product or on its packaging, indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

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Services Available From SSL

Delivery

C100 HDS consoles are available ex-works and may be collected from SSL's headquarters in Begbroke, Oxfordshire, UK. Packing and shipment and installation by specialist carriers can be provided at additional cost. Various options are available but generally consoles will be packed into wooden crates suitable for airfreight.

Commissioning

On-site commissioning by an SSL engineer is available for all C100 HDS systems. Commissioning is usually expected to take three days but can vary depending on the frame size, configuration and options fitted. Systems that include a MORSE router or have consoles split for shipment may require an additional 1–2 days of commissioning time.

You should contact your local SSL office or agent at least four weeks prior to delivery to arrange a commissioning date. Contact: support@solid-state-logic.com.

> *Before the console can be installed all building work should be completed and the environment MUST be clean. The presence of dust – particularly cement particles – increases the chance of long-term damage being caused to the moving faders and other controls. Damage caused by an excessively dusty environment may not be covered by the warranty.*

To allow the commissioning process to proceed without delays the following systems will need to be available before the arrival of the commissioning engineer:

- Air Conditioning blown-through and working
- Installation cables already installed
- Monitor loudspeakers installed and working
- Signal sources available

Training

Three days of standard operator training are available for each C100 HDS system. This is normally scheduled to take place immediately after installation and, if commissioning is included, is usually carried out by the commissioning engineer. A further day of advanced operator training is available at additional cost.

On-site maintenance training is also available at additional cost. Training duration can be either one day for a basic overview or two days to progress to a more advanced level.

Any training should be requested at the time of order. For all training we recommend that no more than five persons attend each session. If the use of an interpreter is necessary the training period may need to be extended (at additional cost). Note that travel and subsistence costs are not normally included. For further information please contact SSL's training department at: support@solid-state-logic.com.

Factory Warranty

All new systems include a 13 month warranty which commences on the date of shipment. This warranty provides:

- Technical support – phone, fax and e-mail – via your local distributor or office during normal business hours and via a pager service out of hours.
- Supply of exchange parts*
- Service engineer visits (note that travel and subsistence costs are not covered by the warranty).
- Maintenance software upgrades.

* It is not anticipated that a visit from an SSL engineer will be necessary in the majority of cases where a replacement part is required. Console sub-assemblies are designed to be easily removable to simplify replacement.

Extended Warranty

The standard warranty period may optionally be extended up to a maximum of 5 years. Three levels of extended cover can be specified: 'Out-of-hours Pager Support', 'Parts supply' and 'Parts and Labour'. In each case the travel and subsistence costs are not included.

Physical Requirements

Console Surface

Each C100 HDS control surface consists of a single 8-fader master section (usually referred to as the centre section) plus additional eight-fader channel bays. Integrated racking sections, producer's tables or corner sections are not available.

- The control surface is available in sizes of 16 to 64 channel faders – plus the centre section.
- The sides of the console are flat to reduce the overall width and to simplify the positioning of adjoining furniture. Where consoles will be freestanding contoured side arms are available to provide a more comfortable finish.
- The console surface is connected to its Blackrock processing rack using standard Ethernet cables. These cables supply all data required for control, channel metering and touchscreen display information. 100m is the maximum distance permitted between the console and its computer rack. (Additional functions such as talkback or the optional loudness metering will require additional cabling.)

Frames can be constructed to include a mechanical split point between any 8-channel section. The console can then be separated at this point into smaller sections to simplify installation into a client's premises. Consoles split for shipment will require additional commissioning time.

Page 4-5 shows the dimensioned layout of a 32-channel frame. SSL's Project Engineering Department can provide dimensioned CAD drawings for other frame configurations – e-mail: projeng@solidstatelogic.com

Systems Integrators will be able to download CAD files of C100HDS console drawings from the SSL SI website.

Blackrock Processor

All audio and control processing functions for the C100 HDS system are provided by a separate rack-mounted computer/DSP processor termed Blackrock.

- Blackrock is 2U high 430mm deep *Refer to page 4-3 for full specifications.*
- The chassis contains cooling fans with the airflow from front to back
- All connections are made to the rear of the rack

Redundant Processing

Systems specified with optional processor redundancy are supplied with a second Blackrock chassis unit so an additional 2U of rack space will be required.

I/O Units

Separate 19" rack units are used to provide input and output connections. The type and quantity of I/O racks supplied varies according to each user's specific requirement for analogue, digital and microphone signals. Units available are as follows:

- ***RIO*** (Remote Input Output) – 7U rack; five slots for various plug-in I/O cards; contains cooling fans *Page 2-25.*
- ***Alpha-Link*** (LIVE-R and 8-RMP) – 2U high 300mm deep; fan-less. It is recommended that a 1U ventilation space be added after every two Alpha-Link units when allocating rack space. *Page 2-21.*
- ***MORSE*** – MORSE Stageboxes are 3U and feature 14 slots into which a range of I/O modules may be fitted. Systems that require resource sharing may also be equipped with the 6U or 3U MORSE router rack *Page 2-25.*
- ***SDI–MADI*** – 1U chassis. De-embeds the audio data from up to four SDI audio signals (SD, HD and 3G).
- ***MADI Remote*** – This feature allows the console to send mic amp control over MADI to third-party amplifiers or routing systems which use the DHD control protocol data, such as Optocore and RocNet systems.

Acoustic Isolation

The console surface, Alpha-Link I/O units and the MORSE racks do not contain cooling fans so can be located in recording areas provided that there is sufficient air conditioning capacity.

The Blackrock processor is fitted with cooling fans and is expected to be housed in a separate '*Machine*' room. Adequate noise isolation should exist between the machine room and the Control Room/recording areas.

The RIO I/O chassis is fitted with temperature controlled lower-noise fans so will also requires a degree of noise isolation from recording areas.

Noise figures for the individual units are listed in the Specifications section from page 4-2.

Air Conditioning Requirements

Air conditioning will almost certainly be required for both the equipment and control rooms in order to maintain the temperature and humidity to the required levels.

Note that a RIO unit fitted with multiple microphone channels can generate significant heat output so must always be operated in a cooled environment.

Power dissipation and environmental requirement figures are listed in Appendices A and E.

Cable Ducting

Cable ducting will be required between the console and the equipment room (as well as to any outboard racks and the recording areas). The ducting provided should be of sufficient size such that approximately 50mm x 35mm is available for console surface connection. This should be sufficient for the analogue and digital cabling for metering and the T/B Mic etc. in addition to the console network connections.

The connectors for all control and interface cables are located beneath the console's centre section. The connector panels are orientated so that cables will exit downwards at the rear of the desk. It is not possible to route cables through the console legs.

The console mains input connectors are located beneath the bay to the left of the centre section.

Service Access

Access to all electronic assemblies within the frame is from either the front or above the console. The power supplies are located in the knee panel area. There are PCB assemblies located behind the channel TFT meter screens. To remove a TFT screen it will be necessary to remove the top trim. This trim is secured using screws along the rear of the top edge. If the console is being built into restricted space – as in some mobile installations – then allow sufficient clearance above the top trim for access to the fixing screws.

Clearance for service access will also be required in front of and behind the rack into which the Blackrock processor and RIO units are installed so that cards can easily be removed. See the drawing on pages 2-10 and 2-14 for minimum clearances.

Technical Requirements

Sync Source

A sync reference needs to be provided for the system to function correctly when connected to external digital equipment. If the generator does not provided multiple buffered outputs then a separate distribution amplifier will also be needed.

- Recommended source of sync is: ***Analogue video*** *(1Vp-p, SD[NOTE 1], PAL, NTSC, Composite, B&B)*. Alternative sources are ***Wordclock*** or ***AES3id***. *See Appendix page 4-16 for a list of supported sync rates.*
- Sync is required by each Blackrock processor. Systems that feature processor redundancy will require two separate sync feeds, one to each processor – sync should not be daisy-chained between units.
- Sync is required by each Alpha-Link LIVE-R I/O unit[NOTE 2].
- Sync will be required by a MORSE router.

NOTE 1 – The Blackrock processor is also able to accept HD and Tri-level sync reference signals. However, the Alpha-Link LIVE and MORSE units cannot accept HD sync signals so a source of SD sync will still be a requirement.

NOTE 2 – Remotely located Alpha-Link LIVE units may optionally be configured to use their incoming MADI signal as the sync reference. Note however, that when operating in this mode, the inherent nature of the MADI signal means there will be a degradation of jitter performance and redundant-processor systems may experience a slight delay and/or drop of audio if it becomes necessary to re-reference to the backup MADI stream.

Mains Input

All units will require a supply of mains power. Supply requirements are 100–230V±10%, 50–60Hz, AC only.

All inlets use detachable IEC-type mains leads. The leads supplied are 2m in length. The free end of each lead is unterminated and will need to be connected to a suitable nearby outlet – the ground wire must always be connected.

C100 HDS systems feature dual-redundant power supplies as standard and are therefore fitted with two separate IEC mains input connectors. (See note on UPS provision below).

The inrush current present when powering the console can be significant – typically ten times the steady current – so the use of 'slow' or 'motor' rated fuses or circuit-breakers is recommended.

Power ratings are listed in the Specifications appendix page 4-2 and on a rating label adjacent to each input connector.

UPS Provision ⚠

Where either supply of mains power is provided from an uninterruptable source (UPS) the output waveform of the UPS equipment must be of the sinusoidal variety. Switched or stepped output waveforms may cause damage to the console power supplies so must not be used.

Grounding

A standard system should not require any additional grounding over and above that supplied by a correctly installed mains supply. The chassis of the console and the audio I/O boxes is permanently bonded to the mains earth pin*. A mains earth connection via the mains inlet must be provided.

** The optional remote GPIO unit is an exception as it does have an isolated chassis. If specified, its case must be separately grounded using the earth stud provided on its rear panel. Refer to pages 2-29 and 3-21.*

All audio connectors, analogue and digital, have their screen pins connected directly to the chassis at the point of entry to comply with AES/EBU EMC grounding standards.

Computer for File Management

The Blackrock processor – in addition to providing the DSP capability – functions as the file sever to its internal RAID storage array. It will be necessary to have access to a computer which can communicate with this server (using SAMBA share) to access operator project files, to update the console's system software, to perform basic configuration and to gain access to SNMP status information.

The PC used for communication with the Blackrock can either be connected over the facility's TCP/IP network or can be a local Ethernet connection. (Note that if connecting directly then the cable may need to be of the 'crossover' type).

The computer selected will need to have an SSH terminal client installed – *'PuTTY'*, for example, if using a PC. Macintosh users can use the *'Terminal'* utility included with OSX.

The Blackrock processor does not support wireless networking.

Computer for MORSE Configuration

If a MORSE router has been specified it will also require connection to a PC. The PC chosen can be the same one as used for file management providing it is equipped with two separate network ports (MORSE router connects to the SSL network, file management uses TCP/IP and the two networks need to be kept separate).

i *For additional network connection detail see pages 2-8 and 3-5.*

Network Hubs/Switches

The Blackrock processor is fitted with an internal 5-port hub. However, this will not be sufficient to form the console network for the majority of studio installations* so additional hubs will need to be provided.

** Redundant systems, systems that include a MORSE router or systems with GPI/O units, will always require at least one external Ethernet hub. A hub may also be required to create the ipMIDI network.*

Hubs or switched provided must be at 100mb capable.

i *For additional network connection detail see pages 2-8, 3-5 and 3-29.*

Installation Cabling

C100 HDS systems are supplied with mains leads, sync termination and short cables to allow the system to be connected for initial testing. Systems are not supplied with the longer runs of network, fibre, sync or other cabling necessary to connect remote I/O boxes or to integrate with associated studio systems. The cables which form part of the studio infrastructure will need to be sourced and installed by the facility or systems integrator.

Network Cables

Standard RJ45 Cat-5e or Cat-6 Ethernet cables can be used. The maximum permissable length of any cable run is 100m.

Cables will need to be installed between the console surface and the equipment area housing the Blackrock processor(s) – two separate cables should be installed to provide a redundant connection. Additional cabling will be required between the Blackrock and its I/O units and also the Blackrock and the file management PC.

Pee pages 2-8 and 3-4 for additional network cabling information.

Sync Cables

Sync must be distributed using 75Ω coaxial cable terminated with 75Ω BNC connectors.

The sync signals provided must be from a common source to all equipment. For example, if both video and Wordclock signals are being used then Wordclock must be generated by, or locked to, the video sync generator.

Analogue Cables

The console surface includes an inbuilt talkback microphone with amplifier and the centre section meter panel is fitted with two mechanical VU meters as standard. To use these features audio wiring will need to be installed between the console surface and the I/O units and/or the facility's comms system.

Additional circuits will need to be installed between the console and analogue I/O if a phasemeter with analogue inputs has been specified.

Digital Cables

Digital wiring will need to be installed if a phasemeter with digital inputs has been specified. Both meter types available include 8 (4 AES/EBU pair) digital input channels.

Cables used for AES inputs should be 110R balanced.

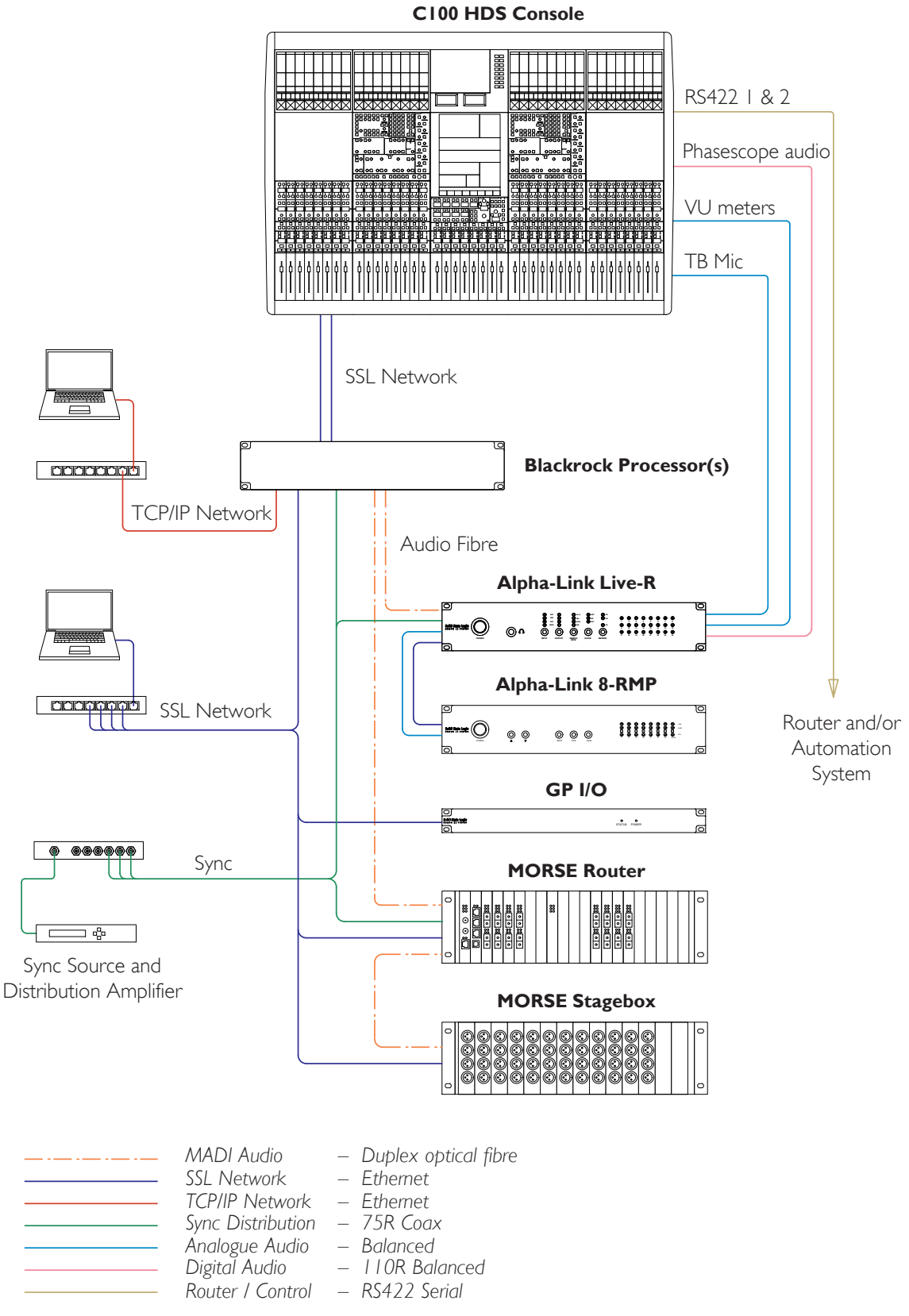
Serial cables

C100 systems include the ability to communicate with routers and automation systems. RS422 serial cables will need to be installed between the console surface, or the Blackrock processor and the remote devices.

Two serial ports are fitted to the console surface and a single port is fitted to the Black rear panel. Note that only two ports can be in use at the same time.

System Wiring Overview

For the majority of installations cabling will need to be installed between units as indicated below:



Fibre cables

Fibre optic cabling will be required between the Blackrock processor(s) and each outboard I/O Unit – RIO, Alpha-link LIVE-R, SDI-MADI and MORSE units all use duplex fibre for audio interfacing. Redundant systems will require two individual fibre links to each outboard unit; see the examples on the following page.

The Alpha-Link 8-RMP microphone amplifiers do not require audio fibre connection to Blackrock. They connect to a local Alpha-Link LIVE-R unit using analogue and network cabling.

It is a sensible practice to install spare cable runs to allow for system expansion or to replace any leads that may subsequently become damaged.

The table below lists the cable and connector requirements.

Fibre Connectors

Source	Destination	Data Type	Connectors	Standard
Blackrock	RIO	MADI or Blacklight	LC – LC	Multimode or Singlemode
Blackrock	Alpha-Link LIVE-R	MADI	LC – SC	Multimode
Blackrock	MORSE Router	MADI	LC – SC	Multimode or Singlemode*
Blackrock	MORSE Stagebox	MADI	LC – SC	Multimode or Singlemode*
Blackrock	SDI–MADI I/F	MADI	LC – ST	Multimode
MORSE Router	MORSE Stagebox	MADI	SC – SC	Multimode or Singlemode*

** MORSE units are fitted with multimode adapters as standard. Singlemode interfaces are available to special order only and will have extended lead-times.*

Fibre Standards

The default interface fibre interface adaptors fitted are suitable for multimode fibre connections. RIO stageboxes and MORSE units may optionally be ordered with singlemode versions for any of the fibre links. (The corresponding port on the Blackrock processor must also be changed to singlemode.) Alpha-Link LIVE is only available with multimode interfaces.

All SSL fibre interfaces use flat (PC) termination not angled (APC).

Singlemode and multimode interfaces and connectors are almost identical in appearance, however, they are operationally incompatible – the two different standards cannot be mixed for any individual link.

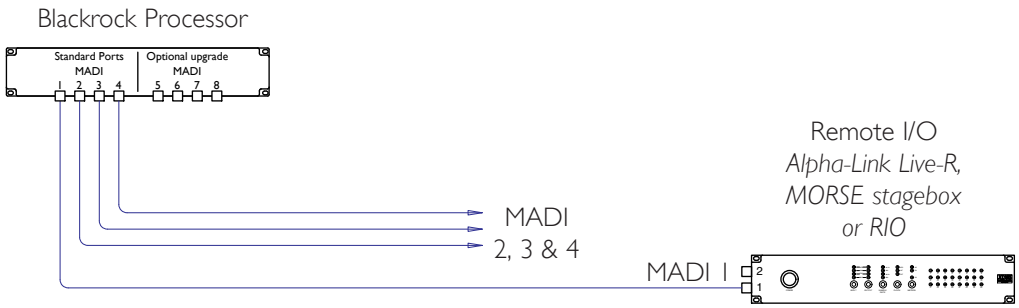
The table below lists the fibre interface standards available and the maximum cable lengths permissable.

Data Type	Fibre Type	Specification	Maximum Length	Note
MADI	Multimode	50/125um	550m	*Default fitment*
"	Multimode	62.5/125um	<300m	*No longer available*
"	Singlemode	9/125um	2,000m	*Option*
Blacklight	Multimode	50/125um	300m	*Default fitment*
"	Multimode	62.5/125um	150m	*No longer available*
"	Singlemode	9/125um	2,000m	*Option*

I/O Fibre Connection Arrangements

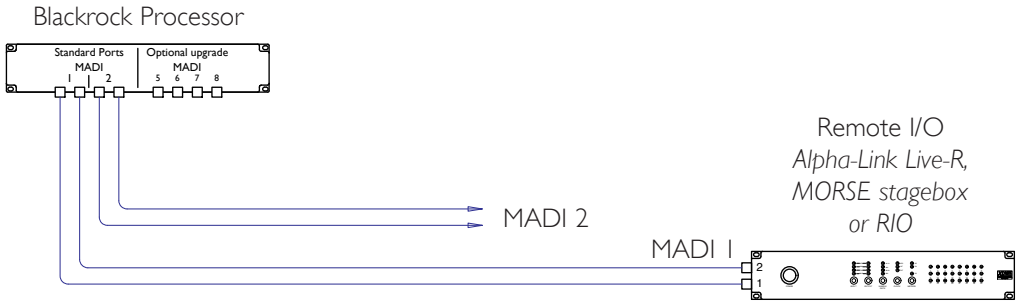
1. Individual MADI

Single Blackrock: Single MADI I/O card fitted (4 ports) – four separate MADI ports are available for the connection of I/O units.



2. Link-Redundant MADI

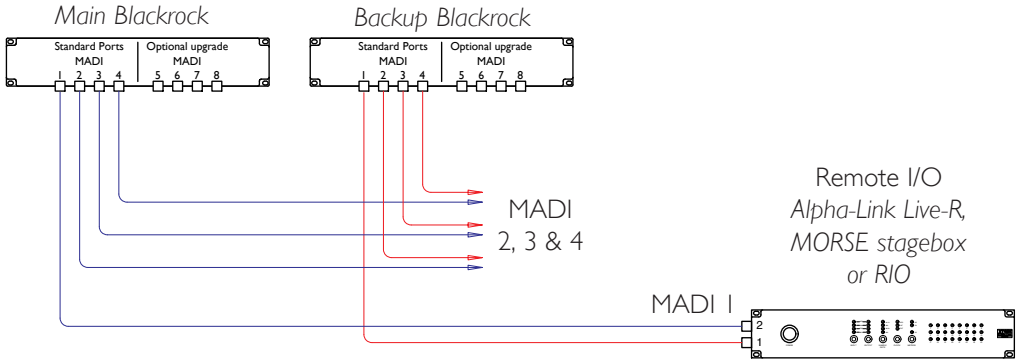
Single Blackrock – Single MADI I/O card fitted (configured as 2 x redundant ports) – backup fibre links to each I/O unit provide for continued operation even if the primary fibre is lost.



3. Processor-redundant MADI

Dual Blackrocks – Single MADI I/O card fitted to each (4 ports) – separate links from each processor to each I/O unit. The ability to swap cores provides for continued operation in the event of a fibre loss or primary processor failure.

Note that the connection of port 1 on the I/O unit to the Backup processor is the correct arrangement.



Channel Capacity

All I/O units use the ***MADI*** standard for audio data transfer; the maximum data capacity of each fibre run is therefore **64** channels.

Alpha-Link Live units use up to 48 channels; MORSE stageboxes use up to 56 channels per MADI link.

Blacklight Interface for RIO Stageboxes

RIO stageboxes may optionally be upgraded to support SSL's high capacity interface standard known as **Blacklight**. Blacklight links provide **256** audio channel per fibre cable thereby reducing the number of cable runs required. Blacklight equipped RIOs are provided with two redundant Blacklight ports to allow for expanded channel capacity and provide fibre redundancy.

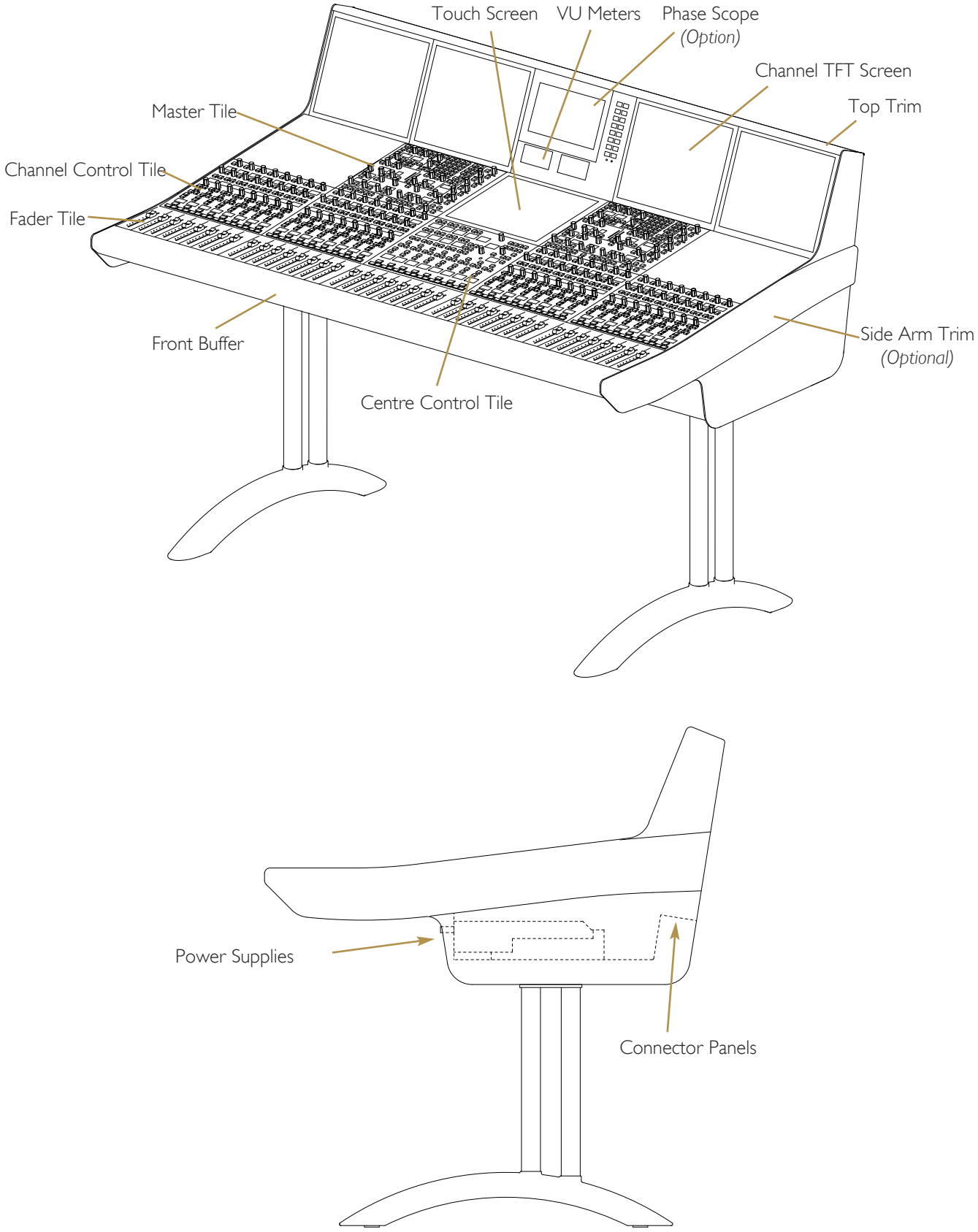
To interface a Blacklight equipped RIO the Blackrock processor must also be specified with a Blacklight interface card in place of one of the standard 4-port MADI interface cards.

Fibre Cabling Examples (See Opposite)

The number of fibre connections that will need to be run between the processor and each remote i/o locations will depend on the type of connection chosen.

All I/O units are equipped with two fibre connectors to allow backup audio cables to be installed

C100 HDS Control Surface Layout



C100 HDS System Components

C100 HDS Console

Frame Layout

Each console control surface will consist of a centre section and from 16 to 64 channel faders in groups of 8. (A group of 8 faders, controls and frame is often termed a '***channel bay***').

The number of physical faders fitted to a console surface does not limit the number of processing channels available; this is determined solely by the quantity of DSP resource fitted to the Blackrock processor. DSP processing is available in blocks of 32 between 64 channels and 256 channels.

Master Tiles

Each console channel bay comprises four separate panels (referred to as '***tiles***'): faders, channel-control, master-channel and the TFT meters. A master-channel tile provides physical access to all operational controls for a channel strip and can be assigned to control any of the channels in the entire console. Because of this flexibility master-channel tiles do not need to be fitted to every bay in the frame; although, for convenience and operator flexibility, master tiles can be fitted to any bay. It is recommended that at least one master-channel is fitted to each side of the centre section

Metering

The centre section is fitted with two analogue mechanical VU meters.

Space is available into which an LCD phase-scope can be fitted. Two types available to order: RTW Touchmonitor TM-7 (8ch analogue plus 8ch digital) or the MSD600M (8ch digital as standard but modular and customisable). Both phase-scopes feature loudness metering as standard.

Trim

The console frame is supplied with flat sides as standard to reduce the overall width. Contoured side arms are available but need to be specified as an option. These will add 72mm to the overall console width.

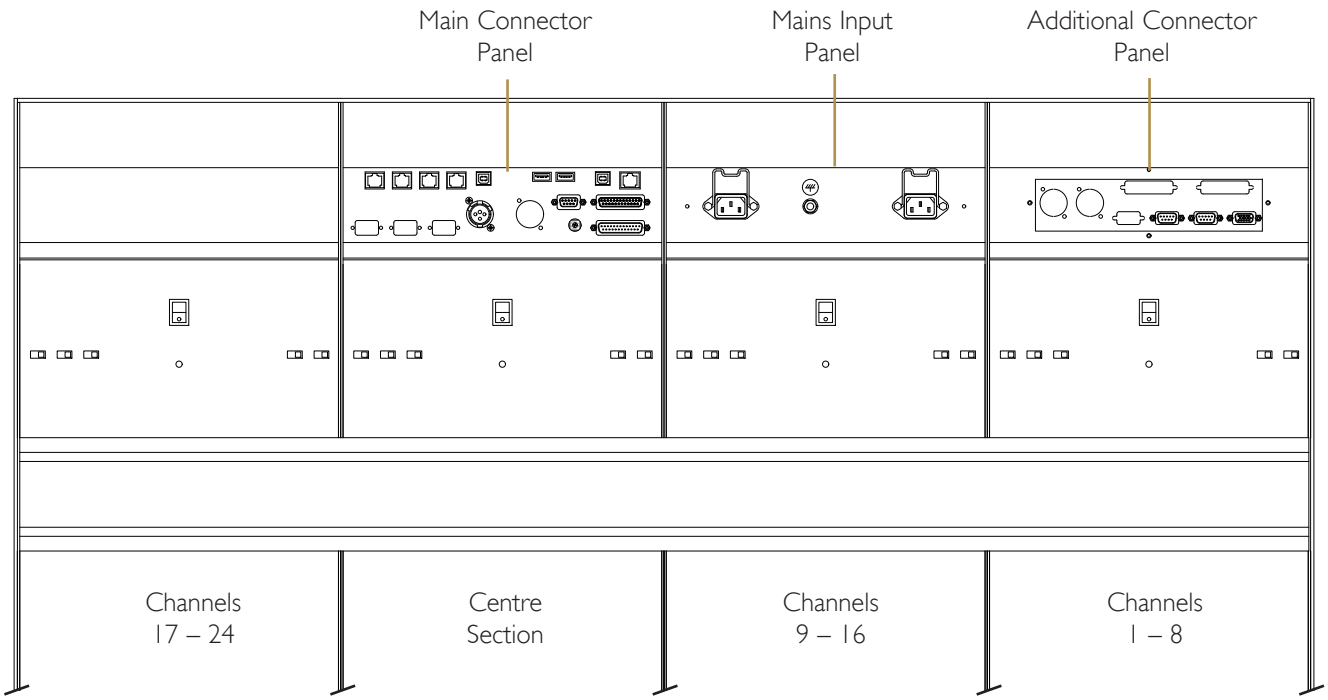
Connector Panels

The I/O connector panel (see diagram opposite) is located beneath the centre section of the console. The mains input panel is located beneath the bay to the left of the centre section.

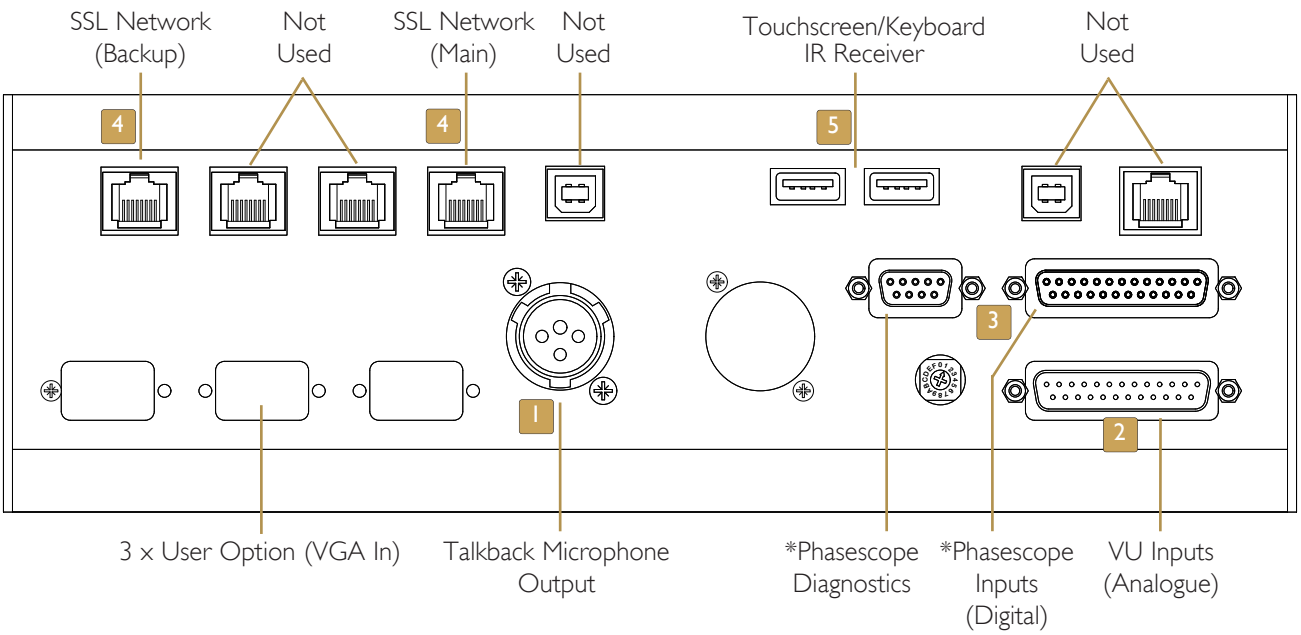
The mounting pillars for the D-sub connectors fitted to the connector panel use the UNC-440 thread.

Connector Panel Layout

24 Channel Frame – Viewed From Below



Main Connector Panel



Console Connectors

1 Talkback Out *XLR-3 male*

The centre control tile of the console is fitted with a talkback microphone. The output signal is analogue, balanced and at approximately 0dBu. *Page 3-23.*

2 VU Meters plus Phasescope Analogue In *D25 male*

VU meter inputs. If a phasescope with analogue inputs has been specified then this connector will also supply the meter's analogue inputs.

3 Phasescope Digital In *D25 female** **/ Diagnostics** *D9 female**

Phasescope digital inputs. Pinout will depend on which model of phasescope is chosen. For both the RTW and DK meters a D9 diagnostic/terminal connector will also be fitted. *Page 3-23.*

**Both connectors are only fitted if a phasescope has been specified.*

4 SSL Network Connections *RJ45*

These connectors link the console to its Blackrock processor(s). Standard Ethernet cables can be used. *Page 3-5.*

5 Touchscreen Keyboard/Mouse *USB*

For the connection of an external USB keyboard as a method of text entry as an alternative to the touchscreen. An infra-red wireless combined keyboard/trackball is included as standard. The keyboard's IR receiver will need to be located above the console's top trim.

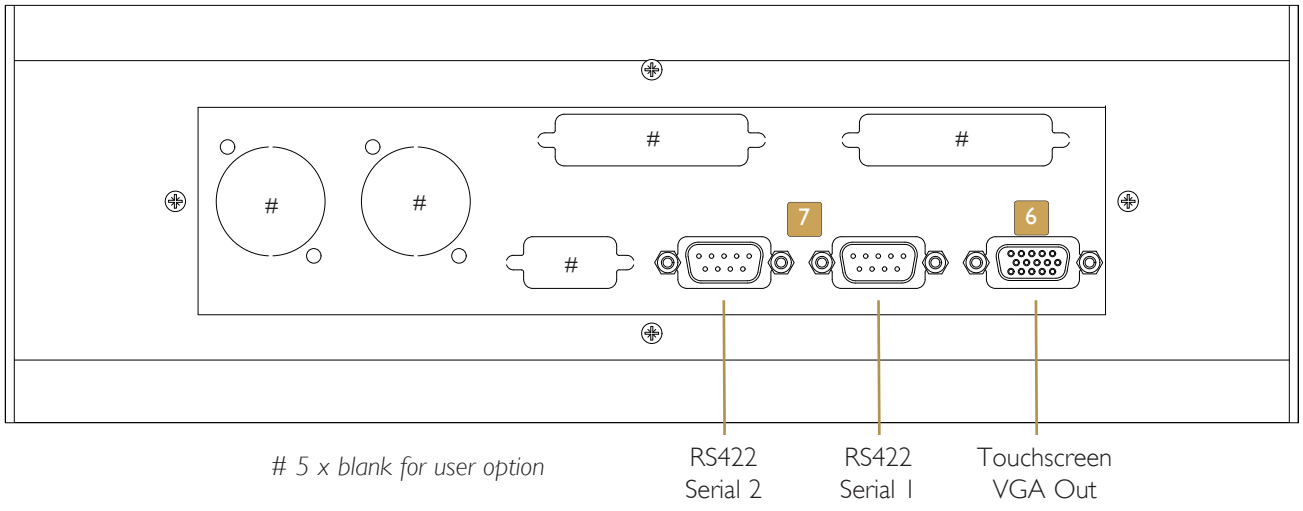
6 Touchscreen VGA Output *HD15F*

Mirrored video output of the centre section touchscreen. Can be connected to an external XGA monitor for backup or training purposes (note that the display is in portrait orientation). *Page 3-27.*

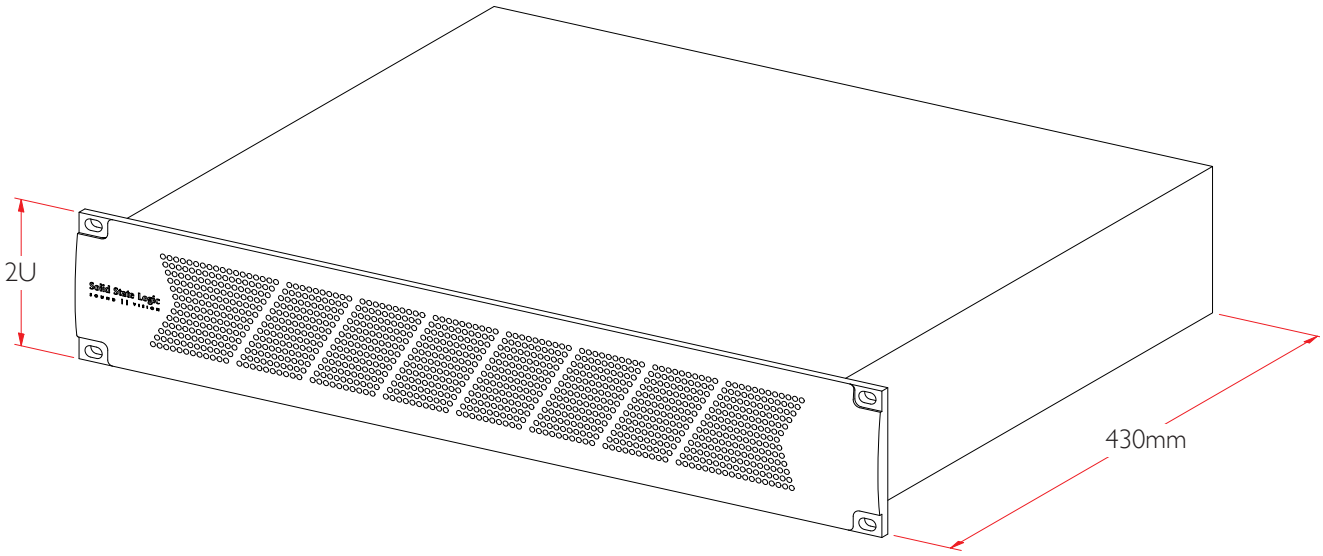
7 RS422 Serial Ports *D9 male*

Two 9-pin serial ports are available for the connection of 3rd party equipment to provide router naming and automation control. Automatic control backup will be included on systems that are equipped with processor redundancy. Allocation of function is setup in system software. *Page 3-27.*

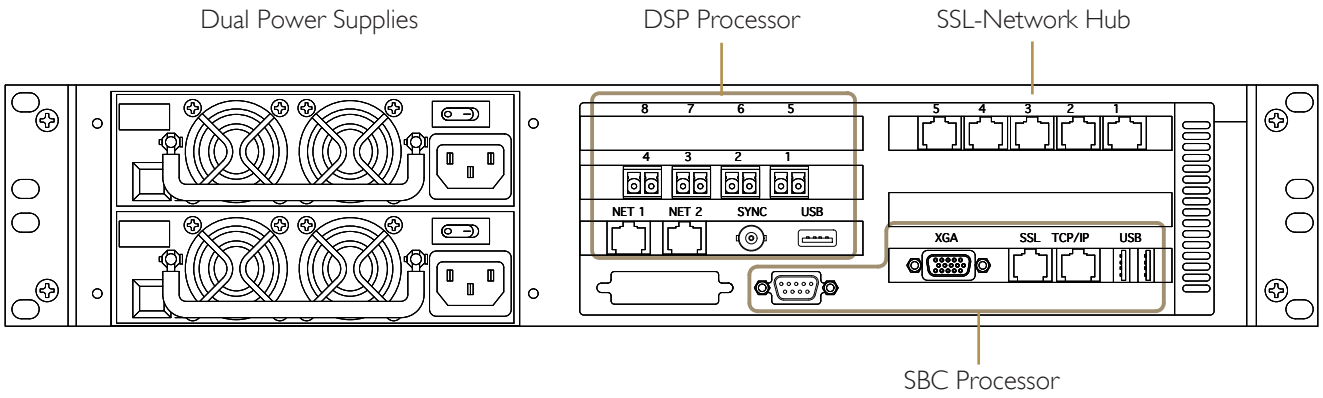
Additional Connector Panel



BLACKROCK PROCESSOR



BLACKROCK REAR PANEL



The Blackrock Processor

The Blackrock processor is 2U high and 430mm deep (excluding connectors). The unit is based on an industry-standard 19" industrial PC chassis and includes dual power supplies. Behind the removable front panel are two swappable SATA hard-drives – these function as one redundant RAID array. Systems that include processor redundancy are supplied with two identical Blackrock chassis.

Each Blackrock unit features two separate control processors: The digital signal processor (***DSP***) and the single board computer (***SBC***) – see below.

Audio Processor (DSP)

The operation of the console control surface and the audio signal processing functions are both managed by a dedicated proprietary PCIe processor card – the DSP card. Audio fibre connections from remote I/O racks are made to this card. DSP processor resource can be specified in 32-channel steps from 64 to 256 full-function channels at 48kHz. DSP resource is always available to channel strips so does not have to be assigned during project setup.

Single Board Computer (SBC)

In addition to the DSP processing engine Blackrock units are equipped with an industry-standard single-board PC. This PC runs SSL's proprietary embedded Linux operating system; so there are no 3rd party licensing requirements. The SBC stores console configurations, operator projects and functions as the host SAMBA file server for the internal RAID storage array. The SBC also provides SNMP remote monitoring data and allows for service diagnostic capability when connected to an external PC via a standard TCP/IP network.

Console Networks

A C100HDS/Blackrock system will require two separate Ethernet networks:

The SSL Network – This network links the Blackrock's DSP and SBC internal processors to the console. The SSL Network will also be extended to include any optional remote peripherals (such as the GPIO relay box or a MORSE resource sharing system) or to add a 2nd (redundant) Blackrock. The Blackrock chassis includes a network hub to simplify the creation of a basic SSL Network, however, most systems will require an additional external hub to be provided.

The TCP/IP Network – A second connection is required to communicate with the client's remote PC. This is a standard Ethernet (internet) network and can be used for file transfer, software updates and monitoring functions.

Although both networks conform to the Ethernet standard the data transfer settings are different so It is important to keep the networks separate at all times.

Fibre I/O Ports

Connection to all I/O units is via fibre-optic cabling – four ports are fitted as standard. A second 4-port card can be added at the specification stage to provide the maximum of 8 ports.

Standard I/O cards provide 64-channel ***MADI*** audio links. RIO, Alpha-Link Live, SDI– MADI and MORSE units all transfer audio using the MADI standard.

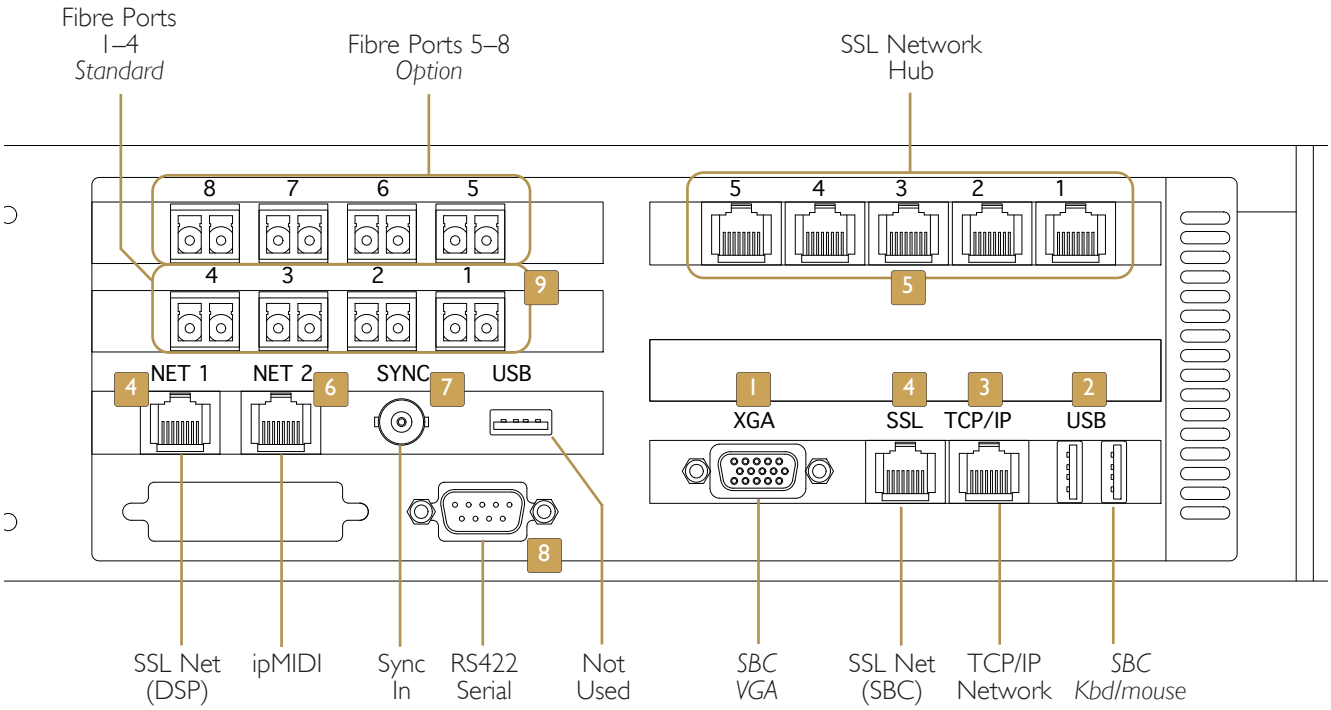
Each 4-port card can also be configured to function as two redundant pairs to simplify the provision of link redundancy.

Blacklight links for RIO Stageboxes

Where higher I/O channel capacity is required, the lower 4-port interface card can be upgraded to the SSL ***Blacklight*** data standard. Blacklight links provide ***256*** audio channels per fibre and operate as two main-plus-redundant pairs. A 4-port I/O card will therefore provide two Blacklight audio links. Note that Blacklight links can only be used with the RIO stageboxes.

Refer to page 2-9 for fibre cable specifications.

BLACKROCK CONNECTORS – REAR PANEL



BLACKROCK CONNECTORS

1 & 2 SBC VGA/MOUSE *HD15F USB*

Optional keyboard input and XGA monitor connection to the internal SBC Linux PC. A connection will only be required during initial system configuration and if network computer is available.

3 TCP/IP NETWORK *RJ45*

Should be connected to file management PC over the facility's Ethernet network. Must be kept separate from the SSL network. i *Page 3-5.*

4 & 5 SSL NETWORK *RJ45*

Both internal processors, the SBC and the DSP, must be linked and connected to the console surface using the inbuilt hub. Redundant systems and those with additional peripherals or a MORSE router will also require the addition of a 3rd party network router so that all items can connect to the SSL network. i *Page 3-5.*

6 IPMIDI *RJ45*

Separate Ethernet connection to facilitate communication with a suitably equipped DAW. i *Page 3-29.*

7 SYNC INPUT *75Ω BNC*

Input for system reference. A sync reference common to all equipment will be required if using digital peripherals. The input is not internally terminated and must be fitted with the external tee-piece and terminator provided (sync must not be daisy-chained between units). i *Page 3-3.*

8 RS422 SERIAL PORT *D9 male*

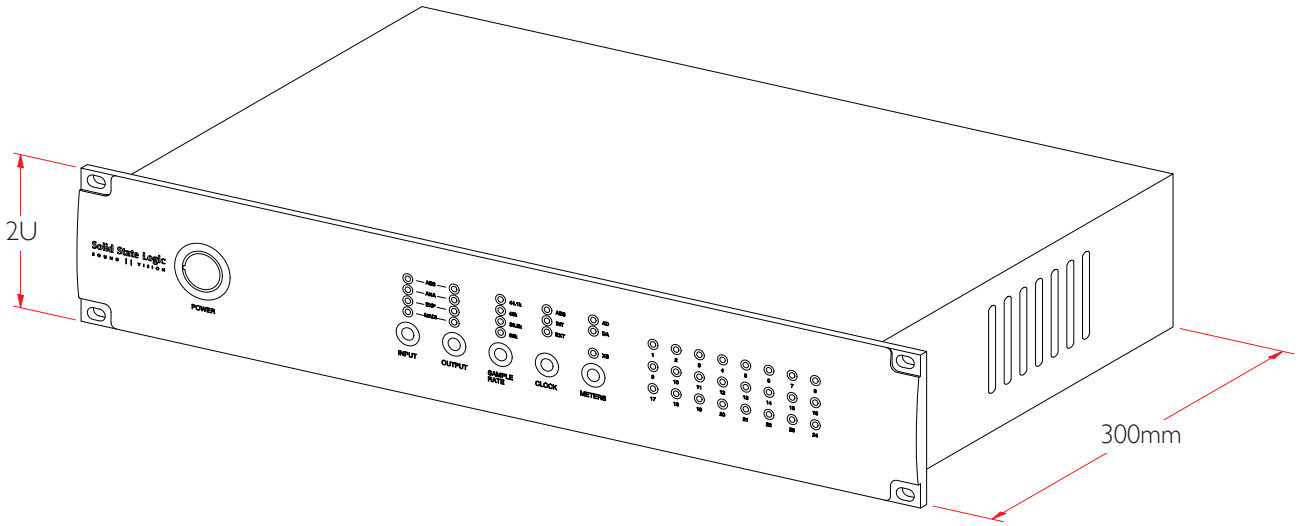
The serial port can be assigned to either the transfer of router names using Probel protocol or as the interface to ROSS/Sony protocol remote controllers (cost option). pinouts. i *Page 3-27.*

9 FIBRE I/O PORTS *Duplex LC*

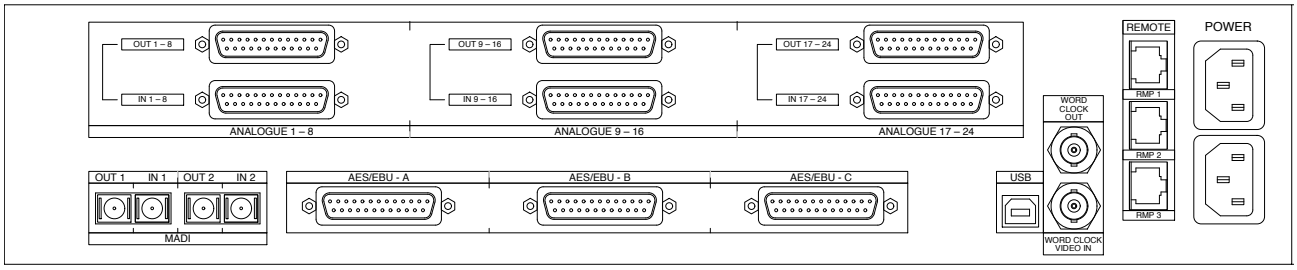
Fibre interface ports for the connection of remote I/O units. Four ports are supplied as standard – each fitted with a multimode duplex LC fibre interface adapter. A second four port card can be specified (as shown opposite) to provide additional I/O capacity.

The standard MADI ports support 64 audio channels, either individually or as two redundant pairs. Blacklight links (RIO only) support 256 audio channels – configured as two redundant pairs.

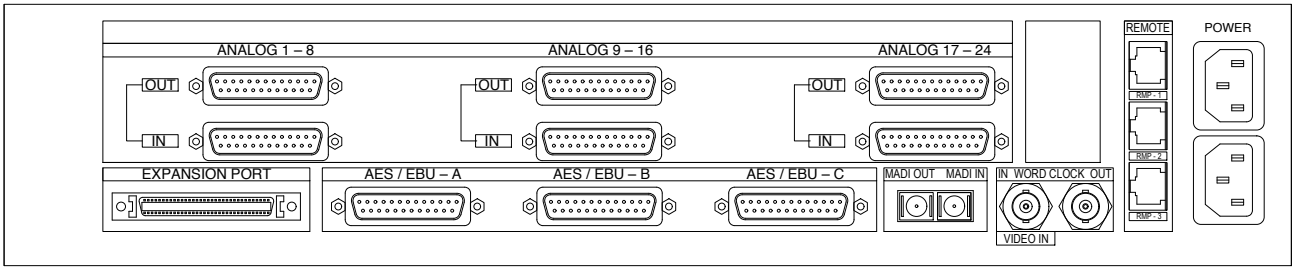
ALPHA-LINK LIVE-R/LIVE



Rear Panel Connectors – Alpha Link Live-R



Rear Panel Connectors – Alpha Link Live



Alpha-Link Live-R

The Alpha-Link LIVE-R is a 2U high 300mm deep 19" rack unit featuring dual power supplies for on-air reliability.

Output levels at 0dBfs are user adjustable to cover the range +14dBu to +24dBu.*

Each Alpha-Link Live-R provides 24 channels of line-level analogue input & output and also 24 channels of AES/EBU input & output. Digital channels 1–8 feature sample rate conversion on their inputs; circuits 9–24 operate at the system sample rate.

The line outputs from the 8-RMP remote Mic amps are connected to the Alpha-Link Live analogue input sockets. When allocating audio circuits ensure that a sufficient number of analogue inputs are reserved for any Mic channels.

Fibre Connection

Alpha-link Live units are connected to the Blackrock processor using fibre optic cabling. Suitable cables should be installed by the facility. Fibre specification is: 50/125µm multimode duplex LC to SC.

The unit will, by default, select the MADI-1 input connector. Should the MADI-1 signal become lost – as a result of a broken or disconnected fibre – the unit will automatically switch to its MADI-2 input.

Connector Summary

Name	Connector	Description
Analogue	D25 F	8 channels, balanced, line-level audio input or output per connector.
AES/EBU	D25 F	4 AES/EBU input pairs plus 4 AES/EBU output pairs per connector.
MADI	SC Fibre	MADI audio data link to the console DSP processor.
Remote 1,2,3	RJ45	Control link to the 8-RMP remote mic units. *Standard Ethernet cables can be used.**
Video In	75Ω BNC	Video sync input required. *(Alternatively, sync can derived from the incoming MADI stream but with slightly reduced technical performance.)*
Wclock Out	75Ω BNC	Provides a source of Wordclock output locked to console sync input.
USB	USB-B	No connection required. *Service diagnostic use only.**

**Alpha-Link LIVE-R only, see below.*

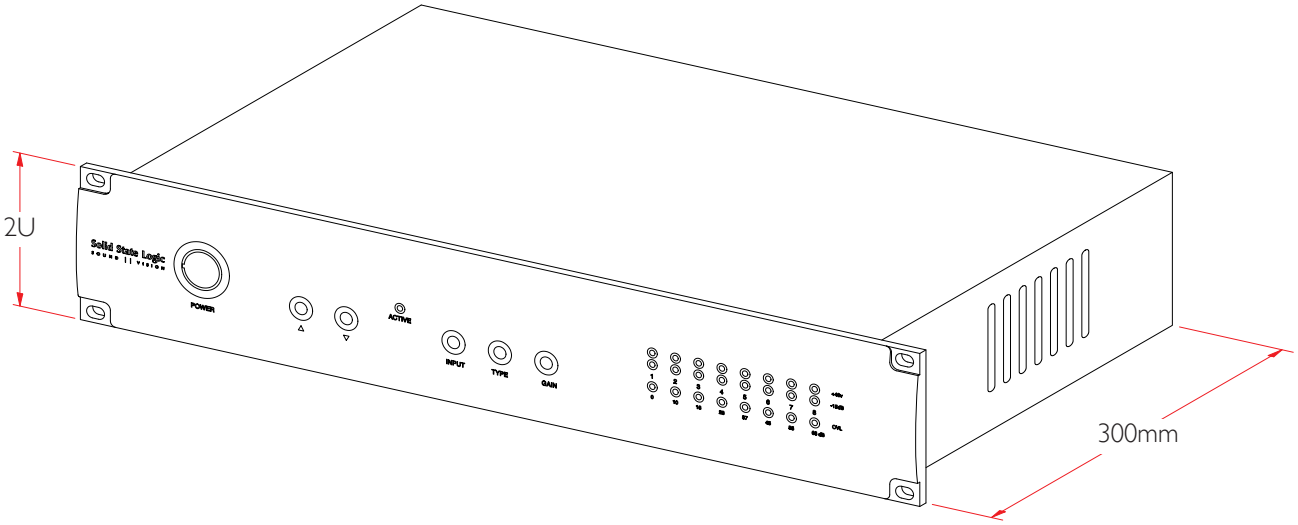
i *See Section 4-11 for the connector pinouts.*

Alpha-Link Live

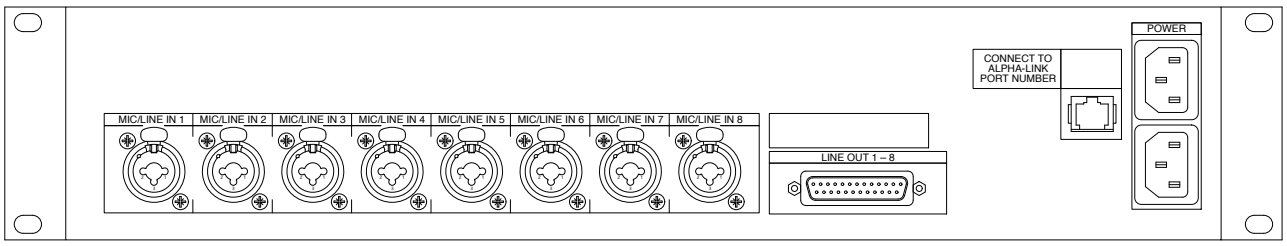
Alpha-Link Live is operationally the same as the 'LIVE-R except in the following areas:

- Only a single MADI fibre connector is included. See panel layout opposite.
- Two versions of the unit are available which provide either +18dBu or +24dBu analogue output level at 0dBfs. This setting is NOT user-selectable so the version required must be specified at the time of order.
- The 'RMP 1, 2 & 3' control connectors have a different pinout. Standard Ethernet cables CANNOT be used.
  i *Refer to Appendix page 4-12.*
- The USB connector is not fitted. The additional 'Expansion Port' connector is not used and does not require a connection.

ALPHA-LINK 8-RMP



Rear Panel Connectors



Alpha-Link 8-RMP

The RMP provides 8 microphone amplifiers in a 2U high 300mm deep 19" rack unit. It features dual power supplies for on-air reliability. Switchable phantom power is available on each input.

The 8-RMPs connect directly to an Alpha-Link Live unit, not to the Blackrock processor. Up to three units can be controlled by each Alpha-Link Live.

Outputs from the 8-RMP are at line level and should be connected to the Alpha-Link Live using 8-circuit balanced audio cable.

Remote control information is provided by a separate RJ45 data cable.* Pairs of audio-plus-control cables can be ordered from SSL in lengths of 1m, 5m, 10m and 25m. Cable pinouts are listed in the appendices. The maximum recommended cable length between each Alpha-link 8-RMP and an Alpha-Link Live is 50m.

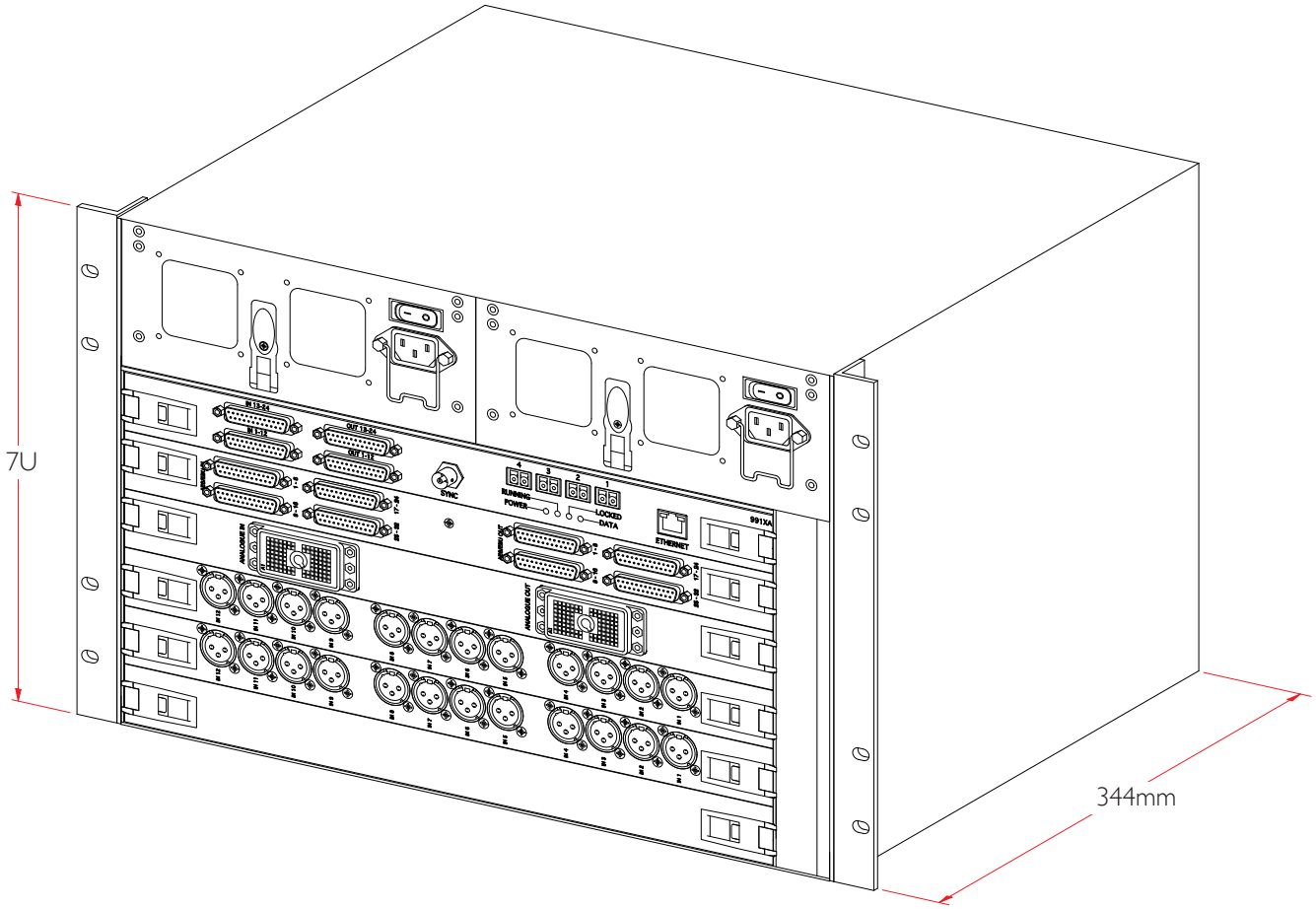
Connector Summary

Name	Connector	Description
Mic/Line In	XLR3 F	Microphone input. Pin 2 +ve. Switchable phantom power.
Line Out	D25 F	8 channel balanced audio outputs, line level.
Remote	RJ45	Control data connection to Alpha-Link LIVE-R.*

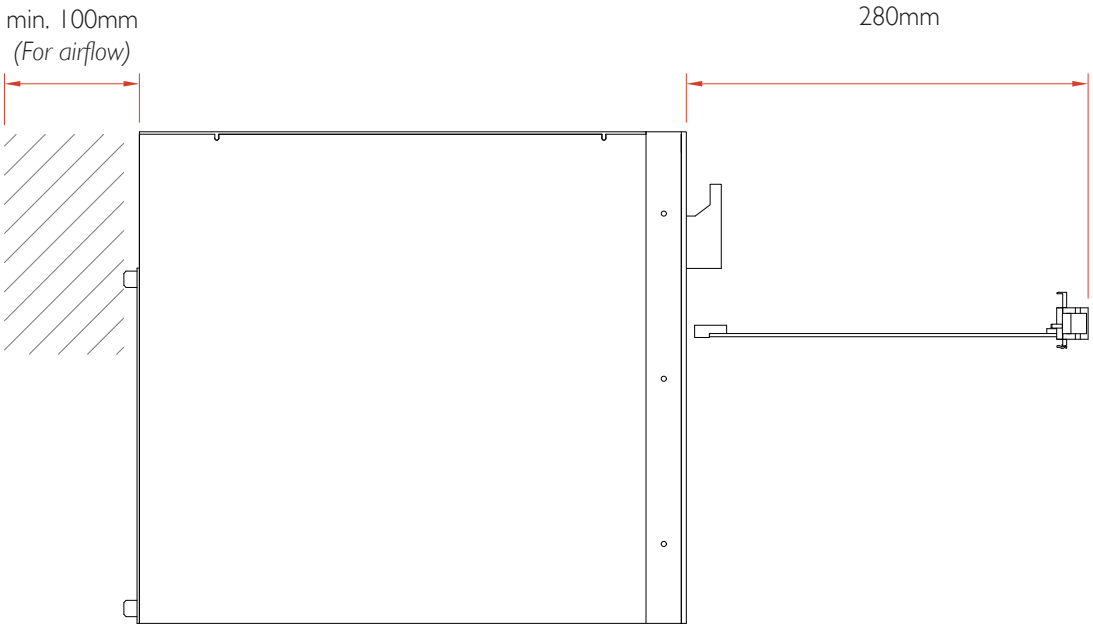
**Standard Ethernet cables can be used to connect to Alpha-Link LIVE-R. Custom pinout is required to connect to Alpha-Link Live.*

See Section 4-12 for the connector pinouts.

RIO Layout



RIO Rack Clearances



Remote I/O Rack (RIO)

The RIO is a 7U high 344mm deep 19" rack unit. Each RIO requires mains power supply and fibre optic cable connection to the Blackrock processor. A maximum of four RIOs can be connected to each C100 system.

All plug-in cards and connectors are accessed via the front of the RIO making it suitable for installation into equipment racks where space is limited. The unit is cooled from front to back using temperature controlled low-noise fans so space for ventilation must be provided behind the rack. A standard 600mm rack provides adequate ventilation space.

RIOs can be fitted with one or two removable power supplies. A single PSU unit has sufficient capacity to supply a fully fitted RIO thus full PSU redundancy can be achieved by fitting two units.

Beneath the power supplies is racking space for six plug-in cards. The uppermost slot is always fitted with the RIO Interface Card. This card provides four fibre MADI interface ports as standard for connection to the Blackrock processor. To accommodate higher channel counts, the interface card can be upgraded to the SSL Blacklight standard.

The interface card is also equipped with 24 channels of opto-isolated GP input and 24 relay-closure outputs.

For connector pinouts refer to page 4-10.

A sync output connector is included which provides a feed of the system's Wordclock reference.

I/O Daughter Cards

Below the interface card five slots are available into which a range of input/output cards can be fitted:

- 24-channel analogue I/O
- 64-channel digital I/O 110R balanced
- 64-channel digital I/O 75R unbalanced
- 12 channel microphone input.

Cards can be fitted in any combination. Cards must be installed starting with slot one, directly below the Interface card, and added in order. See the following page for I/O card details.

Unused slots must be fitted with a blanking panel (supplied) to maintain the correct airflow through the rack.

Fibre Connection

Four fibre ports are available for connection to the Blackrock processor. The default data interface uses the MADI standard which provides 64 I/O channels per fibre link*. The maximum number of audio channels is therefore 256* (4x64).

**To be precise, the limit is actually 254 channels. This is because two channels out of the first MADI stream are reserved for sync, control and status information. See page 3-15 for additional information.*

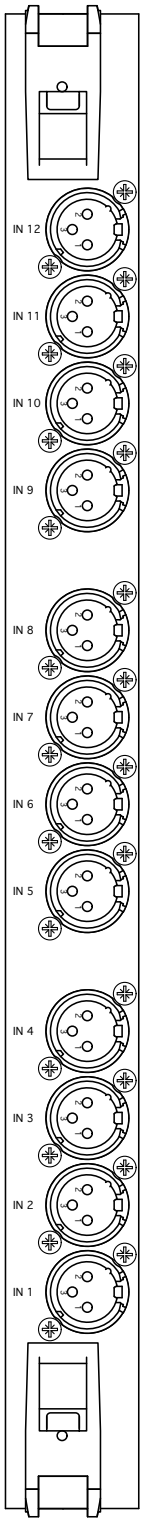
If redundant links or redundant processing is required then the number of audio channels available will be proportionally reduced.

Blacklight Interface

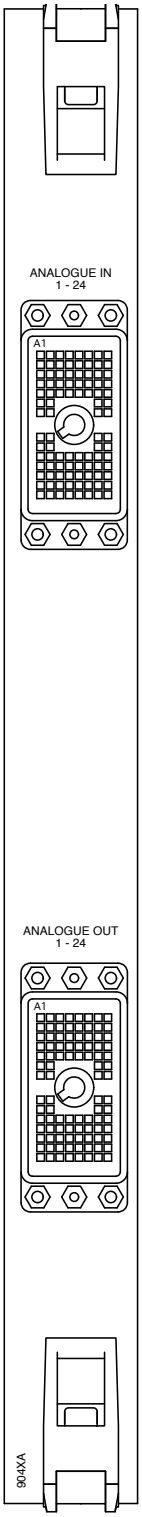
To maintain full channel capacity, the fibre interface assembly can be upgraded to the SSL Blacklight standard which increases the channel capacity to 256 for each fibre link.

Each fibre interface may be fitted with either a multimode (standard) or singlemode adapter. The fibre specification chosen will be determined by the maximum distance of the cable runs required – refer to the table on page 2-9. Singlemode and multimode interfaces and connectors are almost identical in appearance but are operationally incompatible – the standards must NOT be mixed within a system.

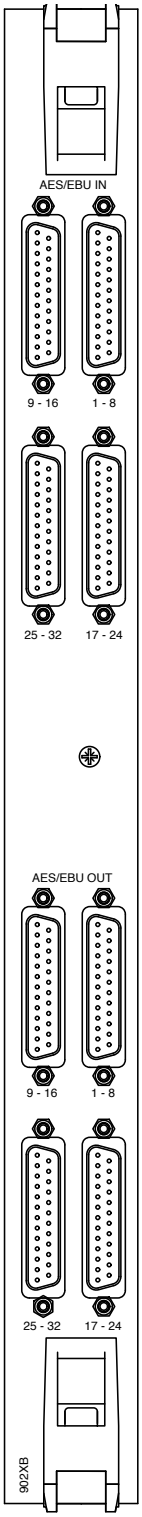
MICROPHONE INPUT



ANALOGUE I/O



DIGITAL I/O



RIO – MICAMP CARD

The microphone input card provides 12 input channels accessible via standard XLR 3-pin female connectors.

The card has been specifically designed to operate in a broadcast environment and meets recognised performance standards. The card is fitted with RF input filtering, a high-speed analogue limiter and features high input CMRR.

Switchable phantom power is available.

RIO – ANALOGUE I/O CARD

The analogue card provides 24 channels of balanced line-level input and output. At least one analogue card will need to be included if analogue monitor amplifiers are being used. The connectors used for input and output are Canon DL96 types. Mating connector kits and a contact crimp tool can be supplied (as cost options).

Connector pinouts are listed on page 4-10.

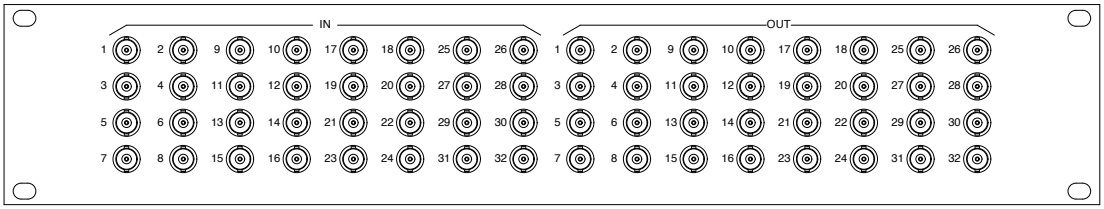
RIO – DIGITAL I/O CARD

The digital I/O card is available in two versions: 110Ω and 75Ω. Both types provide 64 channels – 32 AES/EBU pairs – of digital input and output. The 110Ω card provides balanced output signals whereas the 75Ω card is unbalanced for correct matching to coaxial cables. Sample rate conversion is available on every input so the card can accept input rates from 32kHz to 96kHz. The connectors are all D-25 type females and mating connector kits are available (as a cost option).

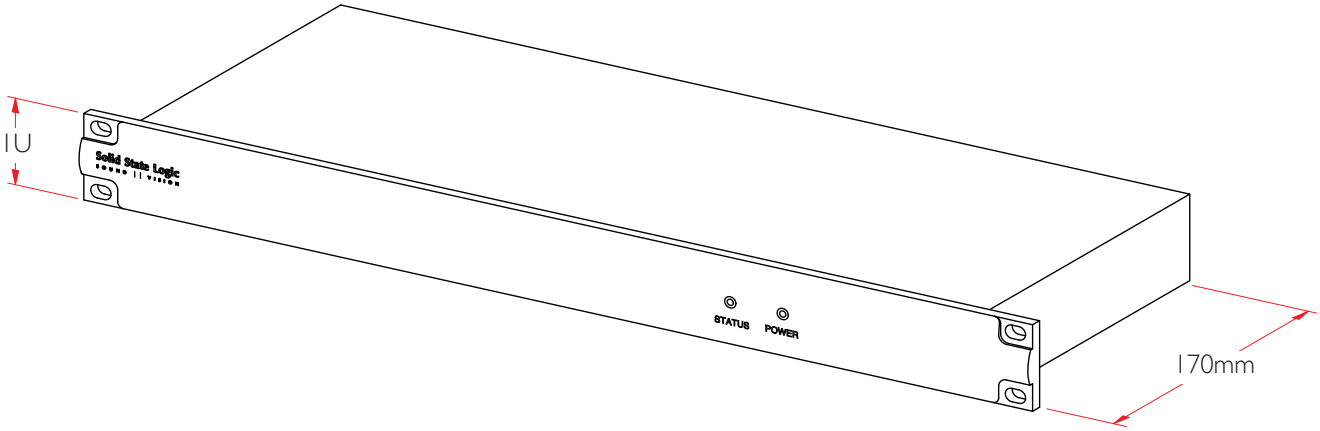
A breakout panel is available for the 75Ω card. This panel converts the I/O card's D-25 connectors to chassis BNC plugs and can be ordered with 1m or 3m interconnecting leads. Do not attempt to extend the panel interface leads beyond the 3m maximum as doing so could increase the risk of data corruption.

Connector pinouts are listed on page 4-10.

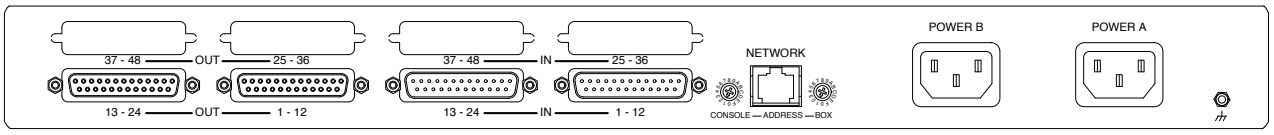
75Ω BNC BREAKOUT PANEL



Remote GP IO Interface



Rear Panel



Remote GP IO Interface

The remote GP IO unit is a 1U chassis which is available in two versions to provide either 24 or 48 channels of GP input and output. Two mains power supplies are standard thus providing '*On-Air*' redundancy.

GP IO boxes connect directly to the *SSL Network* using standard Ethernet cable.

Input and output signals can be configured to be either latching or momentary; settings are individually assigned in software via the touch screen. Momentary the input trigger signal duration must be greater than 50mS.

Refer to Section 4-13 for the connector pinouts.

Chassis Grounding

The internal mains power supplies are of the fully isolated type. It will be necessary to attach a separately earthed lead to the rear of the chassis to ensure a permanent ground connection. An M3 threaded insert is provided on the rear panel for the ground lead.

Input Switching

Inputs are triggered by applying a voltage of between 4V and 30V (AC or DC) across each pair of inputs pins. The current drawn is approximately 10mA.

A 0V reference is available on all input connectors. A protected source of +12V available on all output connectors.

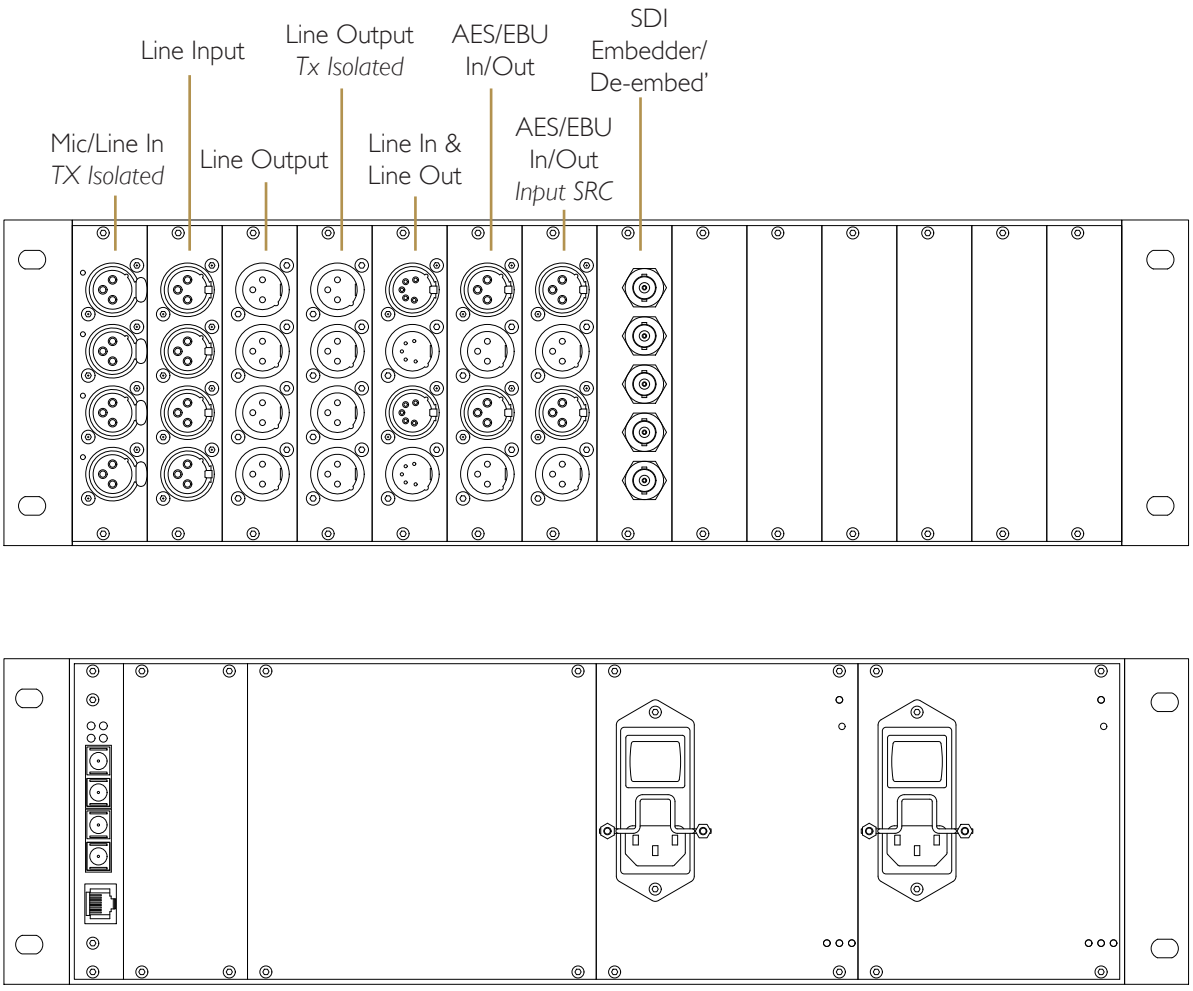
Output Switching

The switch closures are via DIL relay. Contact rating is 100Vdc, 125Vac, 100mA max.

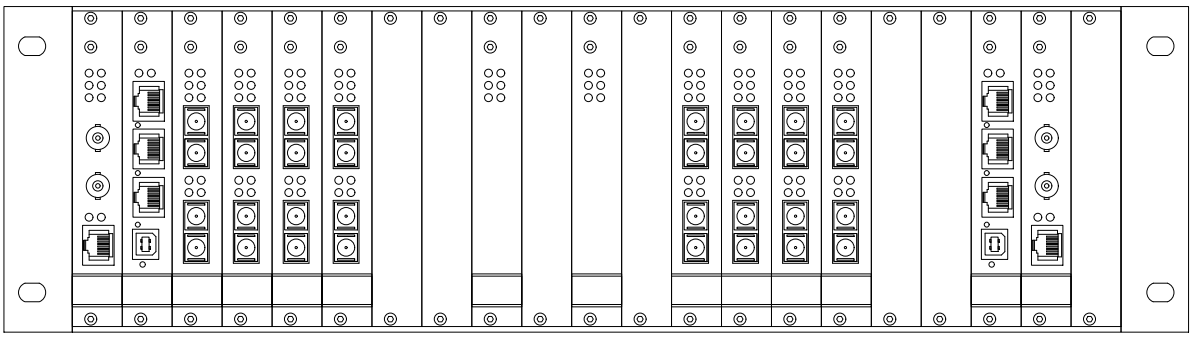
Do not use the output contacts to directly switch capacitive or reactive loads; always use an external relay with a suitable contact rating.

If used for discrete track arming with associated tally, the tally must return to the same number input as the arming output signal, (ie. The tally for GP Out 1 will be on GP In 1).

MORSE Stagebox



MORSE 3U Router



MORSE System (option)

The MORSE (MOdular Resource Sharing Engine) system provides a cost-effective, scalable solution for the sharing of local or remote audio I/O and managing control data. The system is specifically designed for on-air reliability and features optional redundancy on all data links and fault tolerant proprietary software.

The system comprises a central router to which remote stageboxes and consoles may be connected via optical MADI links to provide a resource sharing solution. The router is available as a 3U rack with up to 24 individual links available or as a 6U rack with up to 48 links.

Stageboxes can be connected to the router so that any I/O signal is then able to be allocated to any Blackrock processor connected to the router. If however resource sharing is not a requirement stageboxes can be directly connected to the processor. Both router and stagebox can support redundant fibre link connection.

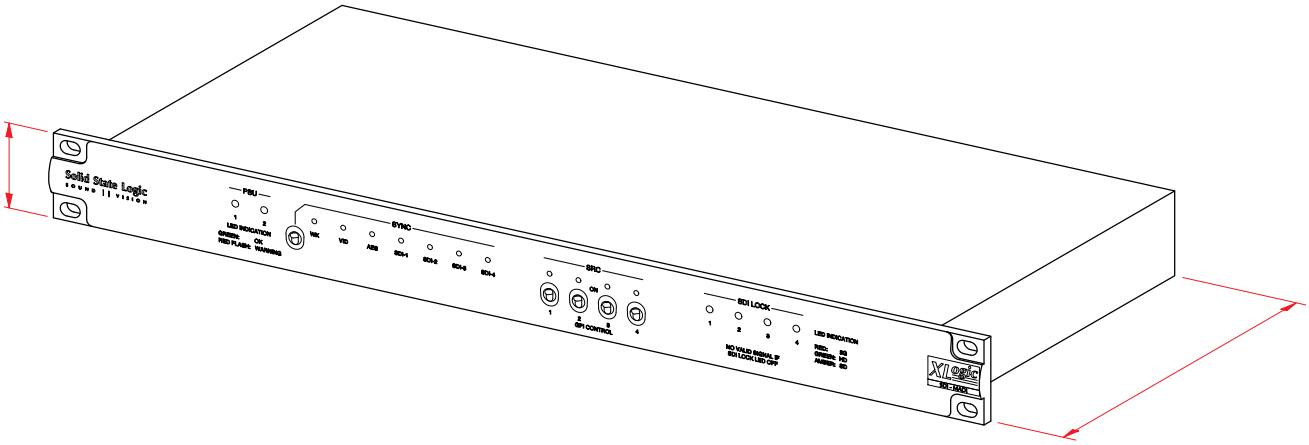
Each stagebox provides 14 slots for input modules so can each can be fitted with up to 56 channels of I/O. Plug-in modules are available that provide: Microphone level input, line level analogue I/O, AES, MADI and HD-SDI embedding and/or de-embedding. A 2nd redundant power supply can be fitted. Stageboxes are connected to the router or console using one or two duplex optical MADI links.

The Stagebox layout and range of I/O cards is shown opposite.

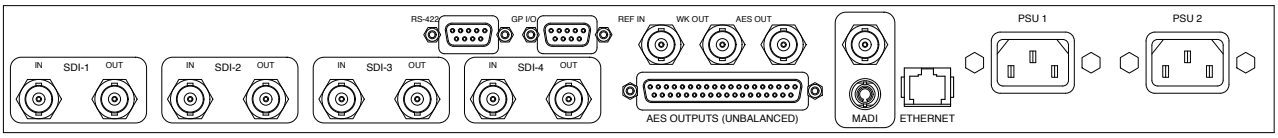
> *The fibre links between the Blackrock and the MORSE router are available as multimode or as singlemode to special order. Blackrock to MORSE fibre leads are LC – SC duplex.*

The MORSE system is more fully described in a separate SSL document *'Morse Specification Guide'* part number: 82S6SMO10A.

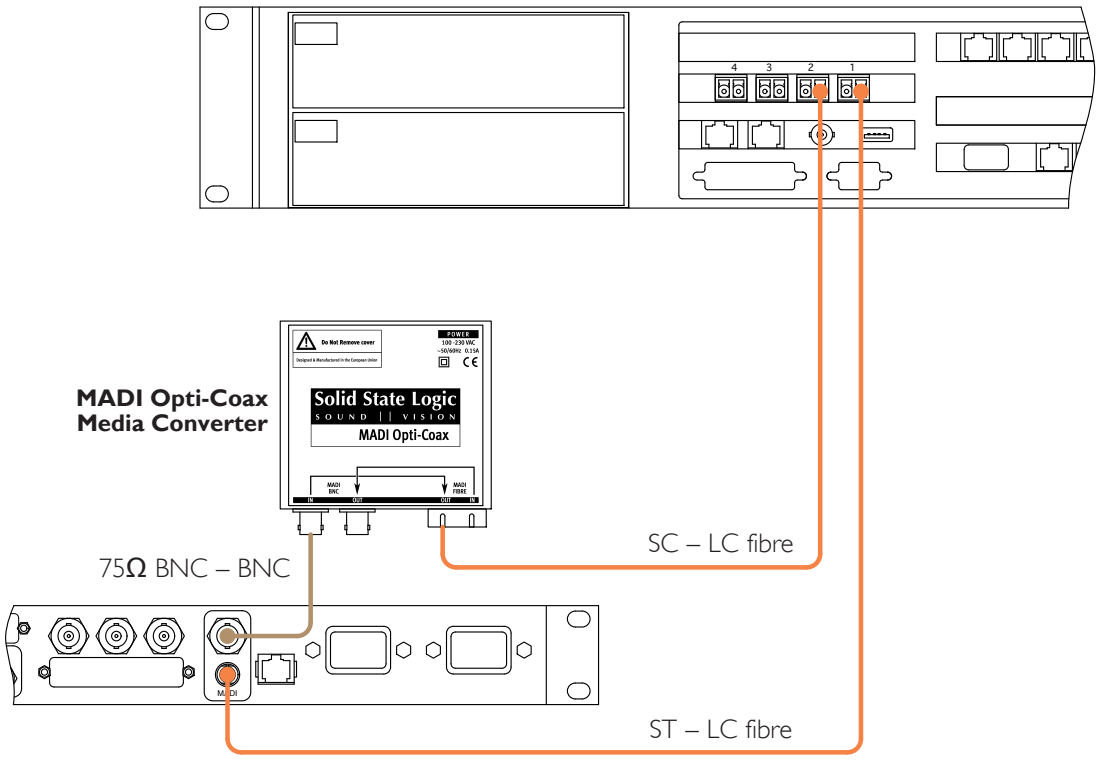
SDI–MADI Interface



Rear Panel



Redundant Fibre Connection Using Opti-Coax



SDI–MADI Interface

The SSL SDI-MADI interface is a 1U rack mounted chassis with two mains power supplies thus providing '*On-Air*' redundancy.

The unit provides the interface between SDI video bitstreams and digital audio. SDI-MADI extracts up to 16 audio channels from each of the unit's four SDI inputs to provide a total of up to 64 audio channels in both MADI (AES10id-2008) and AES3 (AES3-1992) formats.

SDI inputs independently auto-sense between 3G, HD and SD standards and provide loop-through outputs for downstream equipment. With a comprehensive range of synchronising options and switchable sample rate convertors, the SDI-MADI is designed to reliably and seamlessly integrate into any broadcast environment where SDI-embedded audio channels require format conversion.

More detailed installation and operational information can be obtained from the separate installation manual which can be downloaded from the SSL website:

http://www.solid-state-logic.com/broadcastsound/Xlogic%20SDI-MADI/documentation.asp

Fibre Connections

Connection to the Blackrock computer is by single unidirectional fibre (a return path from the Blackrock is not required). Note that the fibre connector on the SDI–MADI unit is the ST version.

If a redundant connection to the Blackrock is required this can be implemented by utilising the BNC copper-MADI connector on the rear panel. This signal is a duplicate of the primary MADI but will need to be converted to fibre media – this can be achieved by using the SSL copper-to-fibre media converter '***Opti-Coax***'. The diagram opposite shows the redundant connection.

System Options

Script Tray

The script tray is an 8-channel wide movable transparent panel which fits over a channel bay. It has rollers fitted to allow it to move along the length of the desk.

The script tray does not require modifications to the console and can be added to existing consoles.

Loudspeaker Shelf

A flat secure shelf is available for the positioning of loudspeakers, monitors etc. Each shelf is 400mm wide by 253mm deep. A shelf is securely attached by locating under the front of the top trim and then screws are used to fix to the console's back panel.

Side Arm Trim

Standard side panels of the consoles are flat to simplify the positioning of adjoining furniture. A smooth contoured arm in contrasting silver finish is available which can be attached to the side panels to provide a more comfortable and attractive finish

TFT External Input

This option adds an input switcher to any of the channel bay TFT screens so that it can then be switched to display the signal from an external XGA (1024x768) video input. The switchover may be effected either by a GPI closure triggered from a free button or by one of the unused latching switches located on the meter panel (see page 43).

Because it is necessary to install additional hardware within the console frame when adding this option, a maximum of three of the four channel screens on the 32-channel console can be modified.

Multichannel User Meter

Space is available in the console centre section into which a multichannel LCD meter can be fitted. Two types available to order: RTW Touchmonitor TM-7 (8ch analogue plus 8ch digital) or the MSD600M (8ch digital as standard but modular and customisable). Both phase-scopes feature loudness metering as standard.

SECTION 3: INSTALLATION

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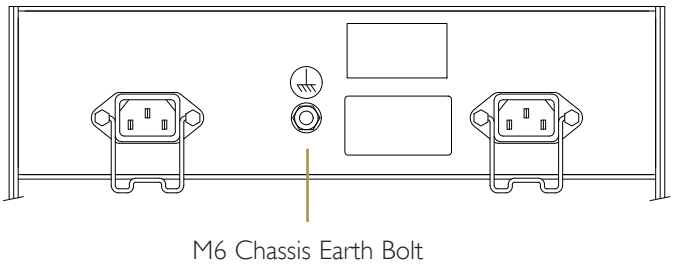
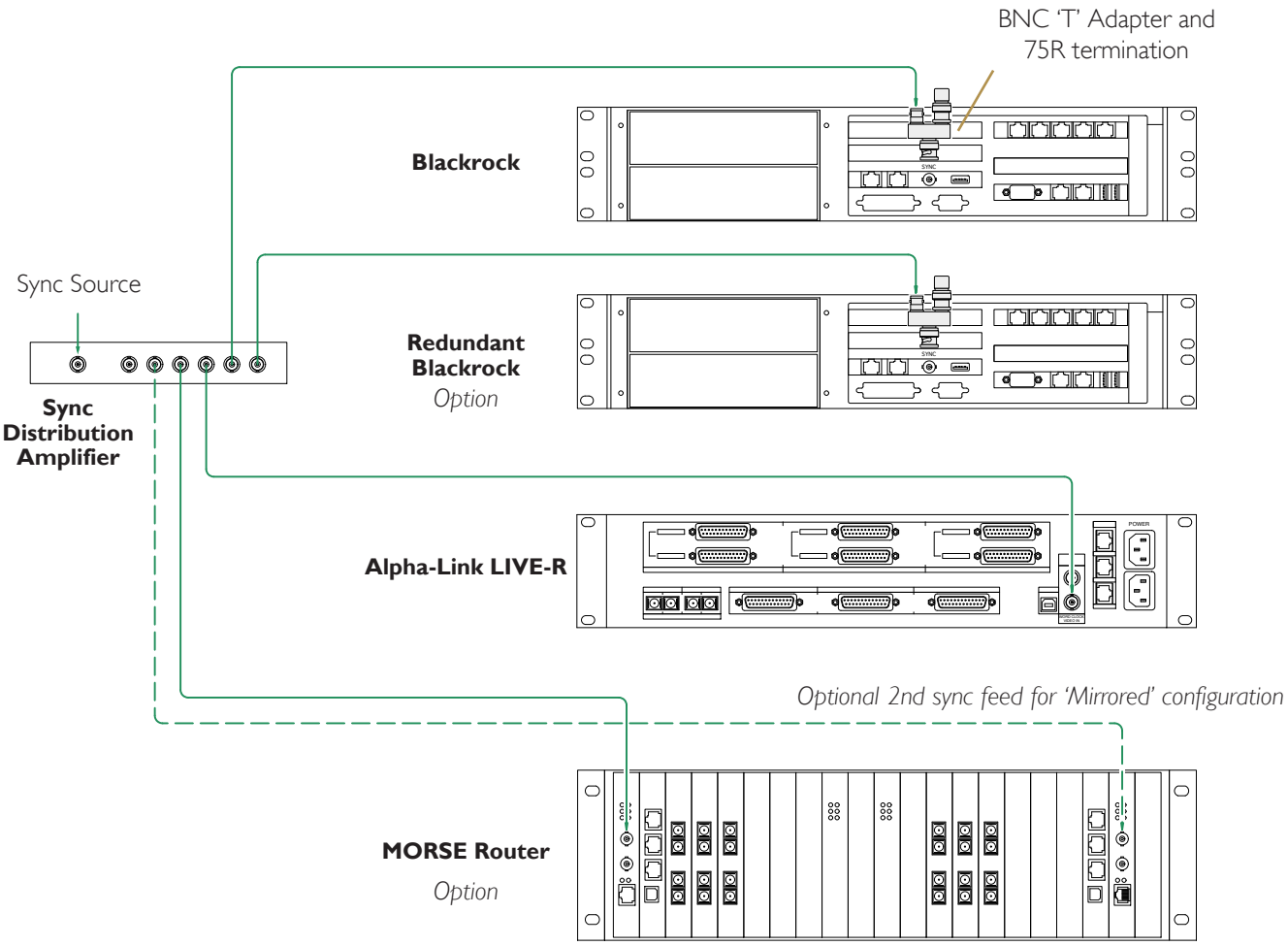
Console Mains Inlet Panel



Sync Connections



Power Supply Connections

All units are fitted with auto-ranging power supplies which will accept mains voltages which range from 100 to 240V ±10% without adjustment. The mains rating label is located adjacent to the mains input socket on the centre section power inlet panel.

THE MAINS SAFETY EARTH MUST BE CONNECTED.

THE TWO POWER SOURCES MUST NOT BE FROM DIFFERENT PHASES OF A 3-PHASE SUPPLY.

For live transmission work it is normally recommended that one of the power feeds should be from an uninterruptable source. (Refer to note on page 2-5 relating to UPS units).

Chassis Earth

The console is fitted with an M6 earth bolt on each mains input panels. This is an optional safety earth connection for external equipment or where the power supply ground may be inadequate. This point is directly linked to the console chassis and to the earth pin of the incoming power lead.

Sync Connections

A sync input signal is required by the Blackrock processor(s), each Alpha-Link LIVE-R* and a MORSE router (where applicable). Sync signals are not required by Alpha-Link 8-RMP or RIO units. See page 2-5 for the sync requirements.

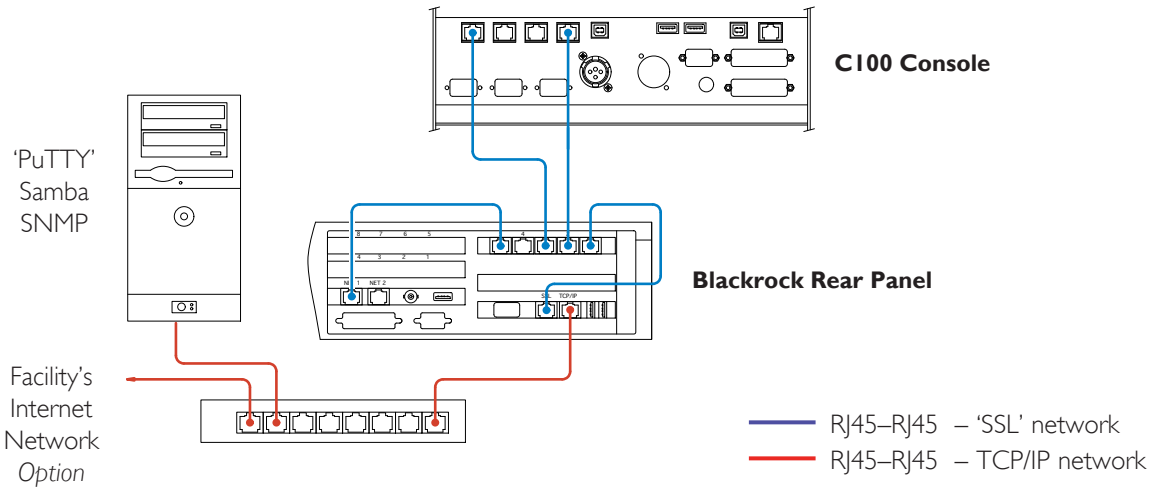
Refer to the diagram opposite for the recommended sync distribution arrangement.

Note that the Blackrock processor(s) do not include internal termination. Termination needs to be provided by fitting the BNC adapter and termination plugs; these items are located in the console's trim kit.

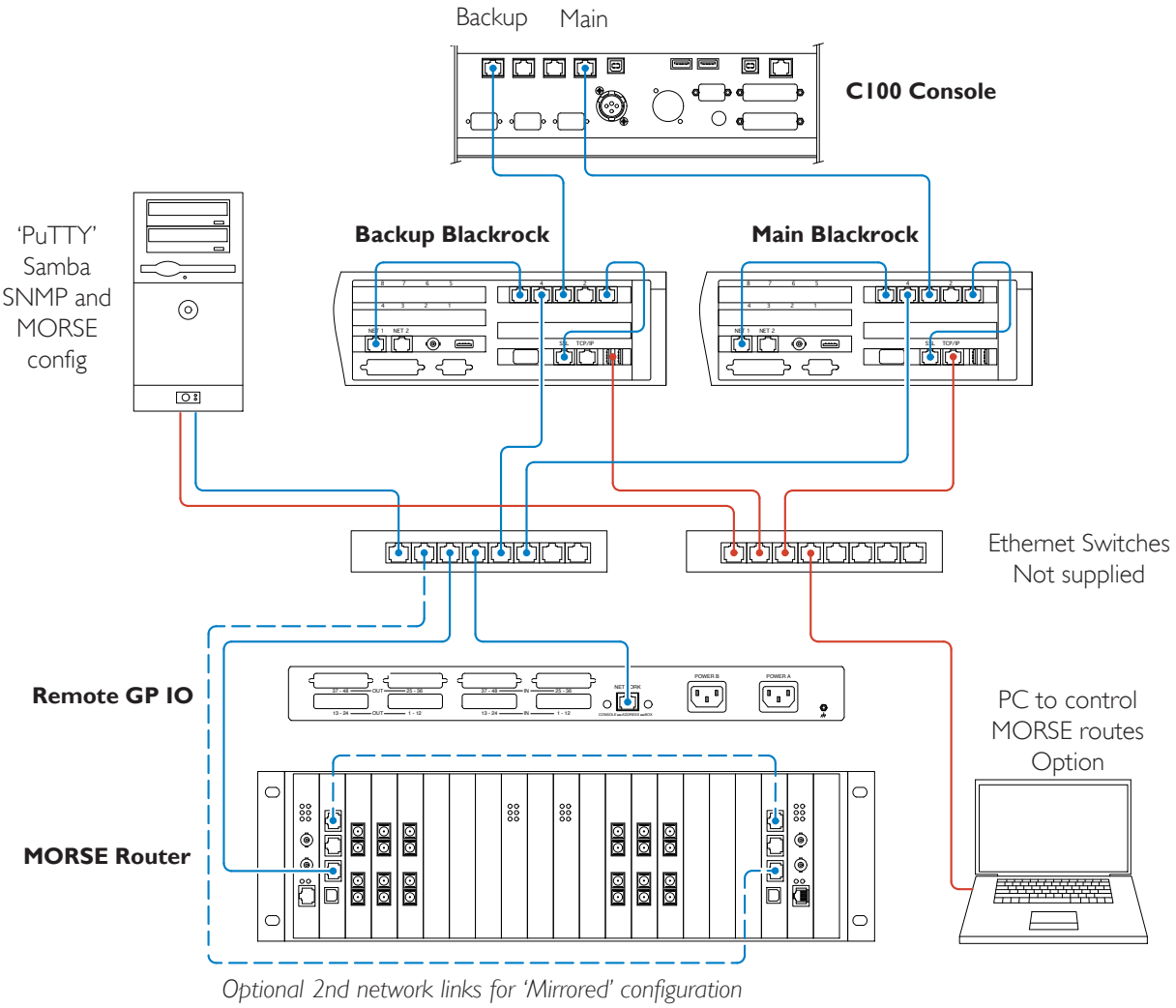
** If an Alpha-Link LIVE unit is positioned at a remote location where it is impossible to provide a sync signal the unit can be configured to use its incoming MADI signal as the sync reference. See page 8 of the Alpha-Link LIVE-R User Manual regarding clock source selection. HOWEVER, when operating in this mode there will be a degradation of jitter performance and redundant-processor systems may experience a slight delay and/or drop of audio whilst the unit re-references to its backup MADI stream.*

Refer to Appendix page 4-16 for the full list of supported sync frame rates

Network Connections – Single Blackrock



Network Connections – Redundant Blackrock with MORSE & GP I/O



Network Connections

Assemble the two console networks as indicated by the appropriate diagram opposite. Standard Cat-5e or 6 Ethernet cables will be suitable for all network connections. Routers should preferably be of an 'auto-negotiating' type and must be of at least 100BaseT capacity.

The two networks use different data structures so it is important that they are kept separate at all times.

SSL Network

The SSL Network is a closed proprietary network used to transfer data between the different items of SSL equipment – including the optional MORSE router.

The short links which connect the Blackrock processor cards to the inbuilt router are supplied. The longer cables that connect between the console surface, additional I/O or PCs are not included and will need to be supplied and installed by the facility or integrator.

The lower diagram shows additional wiring required for redundant processor systems. Note that it is important that the ***Main*** network link on the console should be connected to the main Blackrock processor. *This arrangement will reduce network traffic which would otherwise be routed through the hub.*

TCP/IP Network

The file management PC, hubs and interconnecting cables are not supplied and will need to be sourced by the facility.

The PC – if not already connected to the facility's Ethernet LAN – will need to have a network port available. *Refer to the following pages for details on how to configure the PC for file transfer and project backup.*

Control of a MORSE Router

The routing matrix in a MORSE router can always be controlled by using the console's touchscreen.

Routing, and optional scheduling, can also be controlled remotely using a PC by purchasing an appropriate license.

The file management PC can also be used to control a MORSE router providing it is equipped with two independent network cards. This configuration will also allow additional suitably licensed PCs access the router.

Network Configuration

Once the physical connections between the console and the network PC have been established it is then likely that whoever manages the facility's IT network will wish to perform some initial system administration.

The networked computer used will need to have an SSH (secure shell) client programme installed. Macintosh users will be able to use the '*Terminal*' application that is included with the OSX operating system. For PC users it will be necessary to install a 3rd-party terminal emulator application. (Most terminal applications support ssh connection; the free, downloadable application *'PuTTY'* is a suitable example). This program will be used to communicate with the C100 HDS administration programmes.

Mac 'Terminal' settings should be: [Preferences…/Terminal type: – Xterm Color], [Window Settings.../Display/Wide Glyphs – unchecked] to give the correct colour display.

To be able to log-in to the console's SBC server it will be necessary to know its IP address. The default IP details are listed below. It is recommended that the processors are given usernames to simplify future logins; if a hostname has already been allocated then the IP address can be replaced by the hostname – refer to page 3-9.

User Access to Shared Folders

A user network login is provided on the Blackrock server. This account provides access to all the Samba shared folders used for the storage of projects and backups as well as the uploading of '*Eyeconix*' images.

Access to Shared Folders

IP:	*192.168.1.2 (static)*
Login name:	*sbc*
Password:	*sbc123*

Service Access

A technical-level login account '***SBC***' (Single Board Computer) is also provided on the Blackrock server. This account provides terminal access to all user files. System administrators should always log-in using this account. The default login details are shown on the right.

Some system settings may require a '*root*' password – see 'Administrator access' below.

Service Access

IP:	*192.168.1.2 (static)*
Login name:	*sbc*
Password:	*server*

Administrator Access

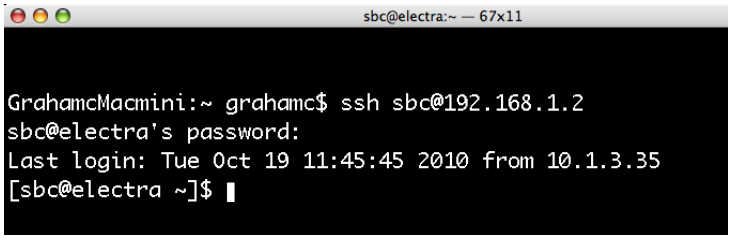
*Note that in order to modify the SBC server's default settings it will be necessary to log in as '**root**'. This login has the full range of access permissions and is able to change or delete system level files. Only log-in as root when prompted and always log-out when finished. The default root password is 'pavili0n' [Note the use of the numeral 0].*

'SBC' LOGIN (MACINTOSH OSX)

- Launch the '*Terminal*' application on the Mac. ('Terminal' is located in 'Applications / Utilities')
- At the terminal prompt type the following command: `'ssh sbc@192.168.1.2'<CR>`
- Enter the sbc password `'server'<CR>`

You should now be logged in to the console server.

Note that in the example shown the server has previously been assigned with the username 'electra'.


sbc@electra:~ — 67x11
GrahamcMacmini:~ grahamc$ ssh sbc@192.168.1.2
sbc@electra's password:
Last login: Tue Oct 19 11:45:45 2010 from 10.1.3.35
[sbc@electra ~]$

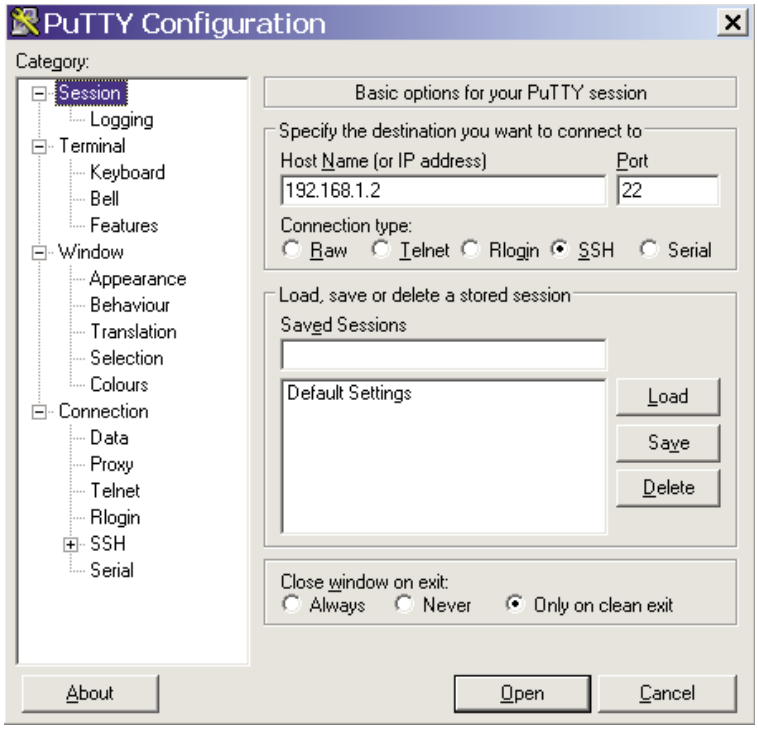
'SBC' LOGIN (PC)

- Once PuTTY is installed on your computer click on its icon to launch the terminal program.
- Enter: '`192.168.1.2`' in the '*Host Name*' field and click '*Open*'
- You will be prompted for the login level, enter: `'sbc' <CR>`
- Enter the sbc password '`server`'.

You should now be logged in to the console server.

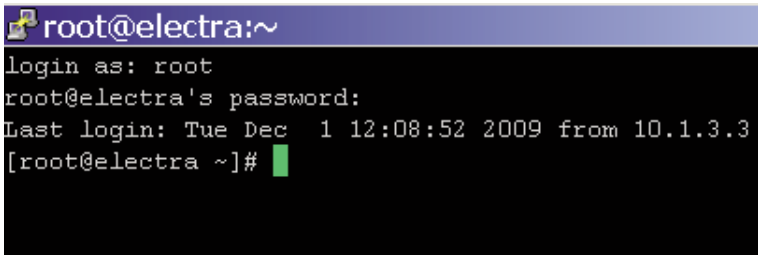
Note that in the example shown the server has previously been named as 'electra'.

> *Other terminal emulator programmes may omit the configuration window stage. For these applications the connection command used in the Mac example may be appropriate.*



'ROOT' LOGIN

- Type `'ssh root@192.168.1.2' <CR>` or enter `'root'` at the login level prompt in place of `'sbc'` as shown above.
- enter the root password '`pavili0n`'



LOGGING OUT

Because the `'root'` login has full access permissions it is recommended that after running either setup program the connection to the server is closed:

- At the server prompt type: `'exit' <CR>`

This action will prevent unintentional alteration of critical files.

TIME ZONE SELECTION

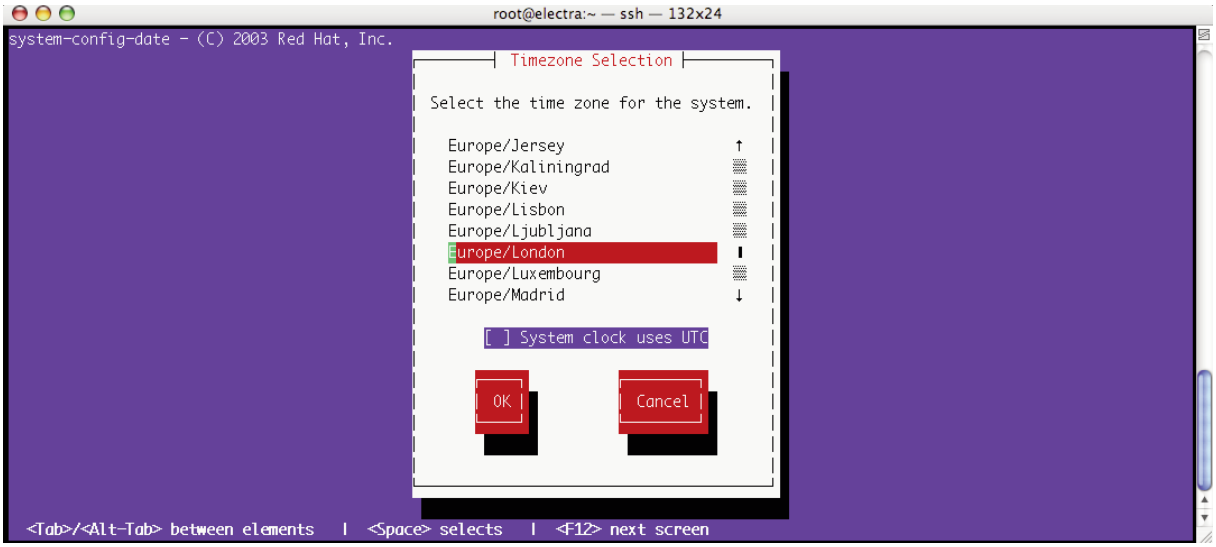
The console's real time clock is set to observe GMT at the factory and should not be adjusted.

It will however, be necessary to enter the studio's global location in order to set the appropriate world time-zone offset value, (unless of course, the studio is also located in a zone that observes GMT).

To enter the timezone selection utility:

- Log in to the console server as '*root*' using the appropriate method shown previously.
- At the server prompt type: `'system-config-time' <CR>`. *Ignore the warning about text entry.*
- Use the Up/Down arrows to choose the appropriate continent and country locations from the lists provided.
- Tab to `'OK'` or `'Cancel'` and press the space-bar to accept. *Do not select the 'System clock uses UTC' box.*
- Once the selection has been made the programme will return to the '*root*' prompt.

Remember to log out of the root level access when finished.



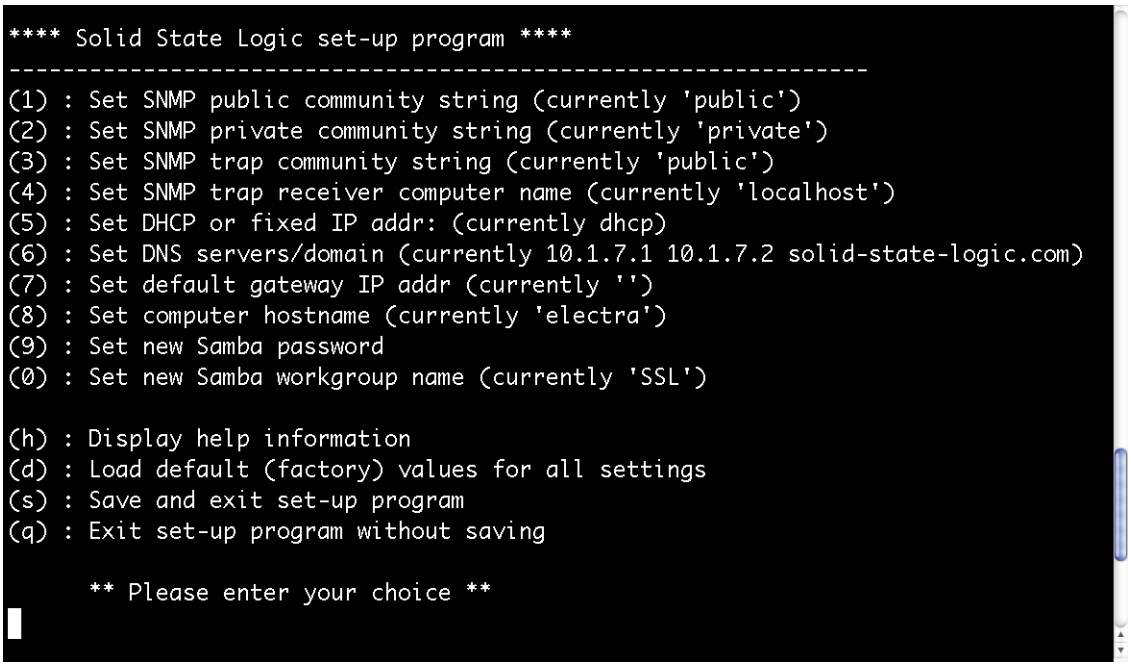
If the console is fitted with a backup processor it is important to input the correct time zone to both the main and the backup servers – the servers will not synchronise correctly if set to different time-zones. It can take 10–15 minutes for dual Blackrock systems to become synchronised.

Server Configuration Options

The default network settings for the console server, such as its hostname and the IP address allocation method, can be changed to suit the client's IT infrastructure.

It is important that values for the network settings are provided by whoever administers the facility's IT systems.

A range of system settings are configurable via a system setup menu as shown below.


**** Solid State Logic set-up program ****
(1) : Set SNMP public community string (currently 'public')
(2) : Set SNMP private community string (currently 'private')
(3) : Set SNMP trap community string (currently 'public')
(4) : Set SNMP trap receiver computer name (currently 'localhost')
(5) : Set DHCP or fixed IP addr: (currently dhcp)
(6) : Set DNS servers/domain (currently 10.1.7.1 10.1.7.2 solid-state-logic.com)
(7) : Set default gateway IP addr (currently '')
(8) : Set computer hostname (currently 'electra')
(9) : Set new Samba password
(0) : Set new Samba workgroup name (currently 'SSL')
(h) : Display help information
(d) : Load default (factory) values for all settings
(s) : Save and exit set-up program
(q) : Exit set-up program without saving
** Please enter your choice **

To access the server's set-up menu:

- Log in to the console server as '*root*' using the appropriate method shown previously.
- At the server prompt type: `'ssl_setup' <CR>`
- The set-up program offers a list of options available to the user. Each option provides on-screen prompts.

Refer to page 4-17 for further information relating to the use of SNMP.

Assigning a Server Hostname (Option 8)

It is recommended that the SBC server is given a hostname; particularly if using DHCP as the IP assignment method. This name can then be used to identify the server for future logins *(In the examples shown on the previous pages it will be noticed that the server has already been named as 'electra').*

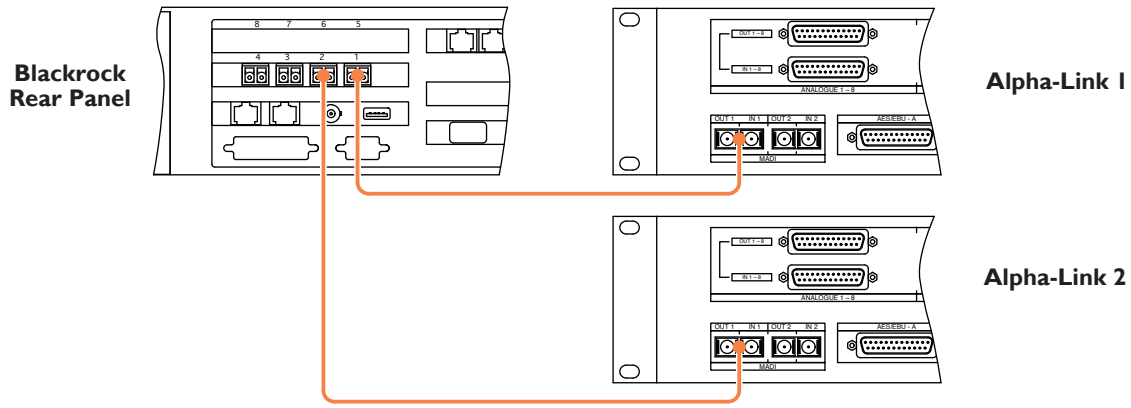
NOTE. In order for the change of name to become effective it will be necessary to reboot the Linux core of the SBC computer. DO NOT assign a new hostname if the console is in use as network changes can result in a temporary loss of control.

To assign a hostname and to reboot the core:

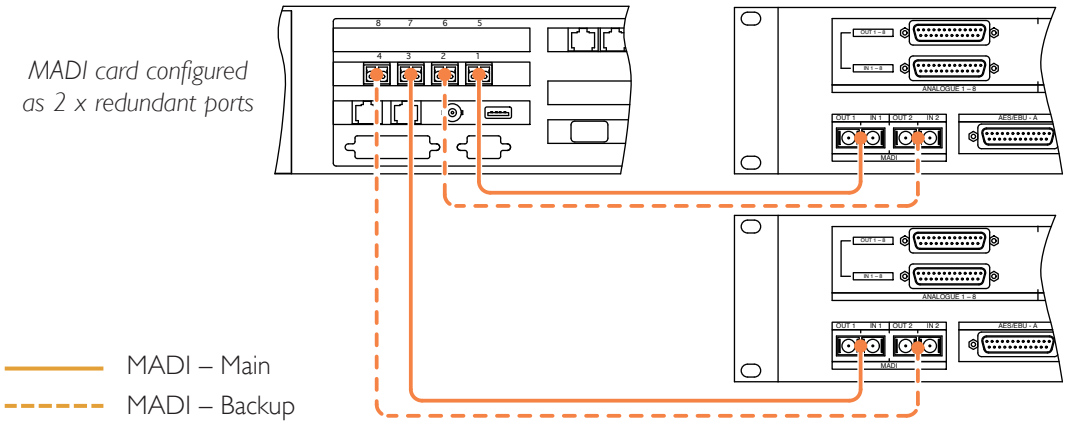
- Enter the chosen hostname string using the ssl_setup program as shown above.
- Save and exit the setup program using the `'(s)'` option. *(You may receive a network restart message).*
- Then, at the server prompt, type: `'reboot' <CR>`

The core will then immediately restart and you will be logged out.

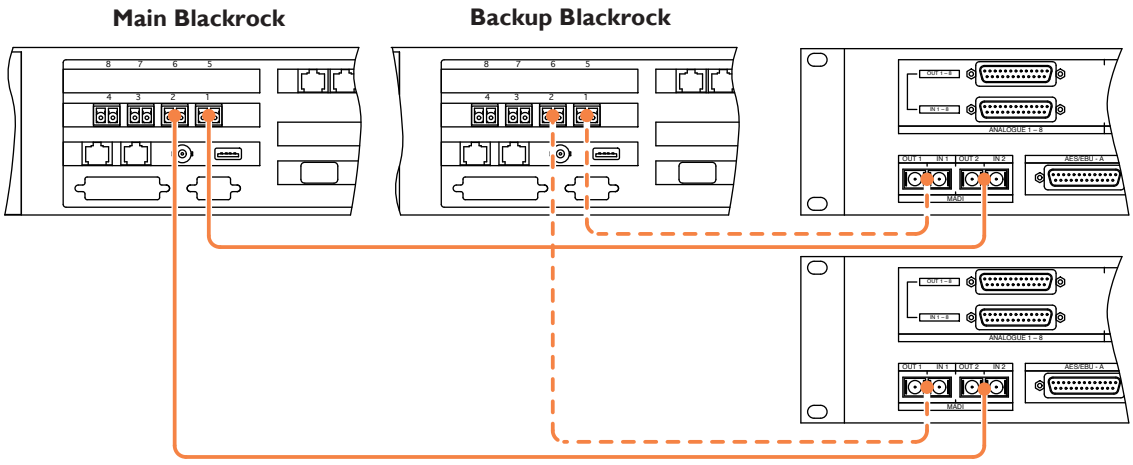
Fibre Connections – Single MADI



Fibre Connections – Link Redundancy



Fibre Connections – Link plus Processor Redundancy



Alpha-Link Live-R

Connect the sync sources as described on page 3-3.

Refer to page 4-11 for the connector pinouts.

Fibre Cables

2m fibre cables are supplied with each Alpha link Live-R which can be used for initial testing or if the units are adjacent to the Blackrock processor.

It is the responsibility of the facility or system integrator to supply longer fibre cables that may be necessary to allow the Alpha-Link units to be remotely located.

Each unit will require one or two fibre cable runs depending on the method of connection to the Blackrock. The diagrams opposite show the different connection arrangements.

- Cable specification is: 50/125µm, multimode, duplex LC (at the Blackrock) to SC (at the Alpha-Link).
- Singlemode 9/125µm cables cannot be used.
- It is recommended that spare cables are run to remote units to allow for damage or future expansion.

Suitable cables are readily available from networking and computer supply outlets.

Analogue I/O

Balanced analogue inputs and outputs are available via the D25 connectors. Each connector provides eight channels.

Digital I/O

Four input circuits and four output circuits of 110Ω balanced AES/EBU are provided on each connector. Use only appropriately matched 110Ω cable for the connection of digital equipment.

Digital channels 1–4 feature SRC conversion on their inputs. All other digital inputs operate at the system sample rate.

Unbalanced Digital I/O

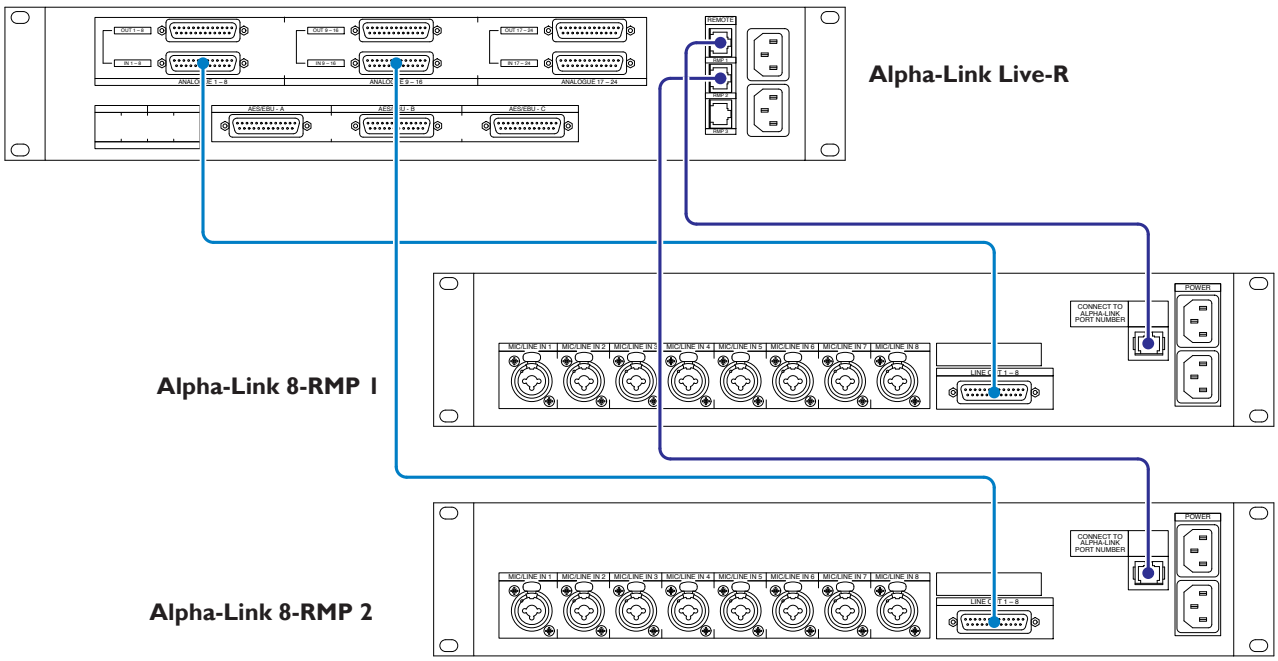
A 1U, 32-channel, BNC converter/breakout panel is available for the connection of 75Ω unbalanced digital equipment.

Panels can be ordered with either 1m or 3m connection cables. Note that 3m is the maximum distance at which the panel can be located.

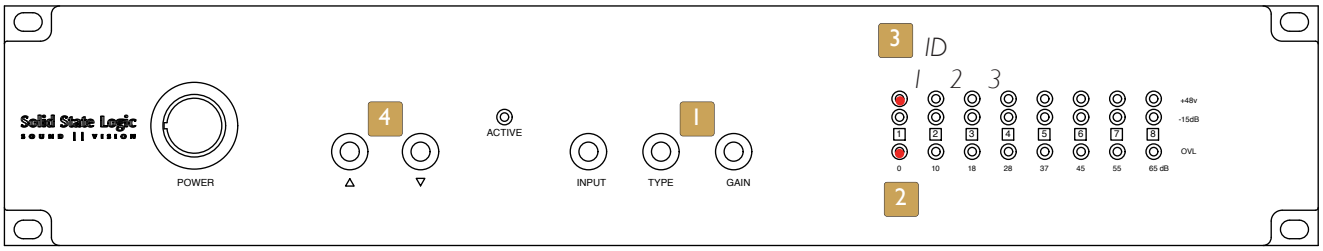
8-RMP Remote

For remote control connection to separate Alpha-Link 8-RMP microphone amplifier units. See following pages.

Alpha-Link Live to 8-RMP Connections



Remote Port Configuration



Alpha-Link 8-RMP

Each 8-RMP remote microphone amplifier unit will require audio plus separate control cabling to be installed. Standard audio-plus-control cable sets are available to order in 1m, 5m, 10m and 25m lengths.

i *Refer to page 6-10 for connector pinouts.*

Audio Connection

Microphone inputs are via XLR 3-pin female connectors.

line-level outputs are provided on a 25-way D-type female connector. A pin-to-pin individually screened, balanced audio cable should be used to connect the 8-RMP output to one of the Alpha-Link LIVE-R analogue input connectors.

The recommended maximum length of audio cable between Alpha-Link Live-R and 8-RMP is 50m. Although longer leads will still function there is likely to be a gradual reduction of audio performance. Loss of control may occur at over 100m.

Remote Control Link

A separate RJ45 lead must be connected to each RMP unit to provide remote control of the gain, pad and phantom power settings – standard RJ45 Ethernet cables can be used to connect to Alpha-Link **LIVE-R*** units.

** The 'Remote' connector on the earlier Alpha-Link **Live** unit does NOT follow standard Ethernet pinout. Refer to page 6-10 for the custom cable pinout. Alternatively, leads are available to order in 1m, 5m, 10m and 25m lengths.*

Remote Port configuration

The 8-RMP units must be configured with an identification number (ID-1, 2 or 3) via the front panel buttons to match the corresponding '*Remote*' port used on the controlling Alpha-Link. A unit configured to be ID-1, for example, will not respond if connected to Alpha-Link LIVE-R '*Remote*' ports 2 or 3.

To set the channel ID port:

a. Switch off the power, remove the RJ45 control lead and re-apply power to the 8-RMP unit.
   If the unit is already communication with an Alpha-Link LIVE-R it will not be possible to alter the configuration.

b. Press the 'TYPE' and 'GAIN switches 1 down together for about 1 second.
   This will enter the configuration mode.

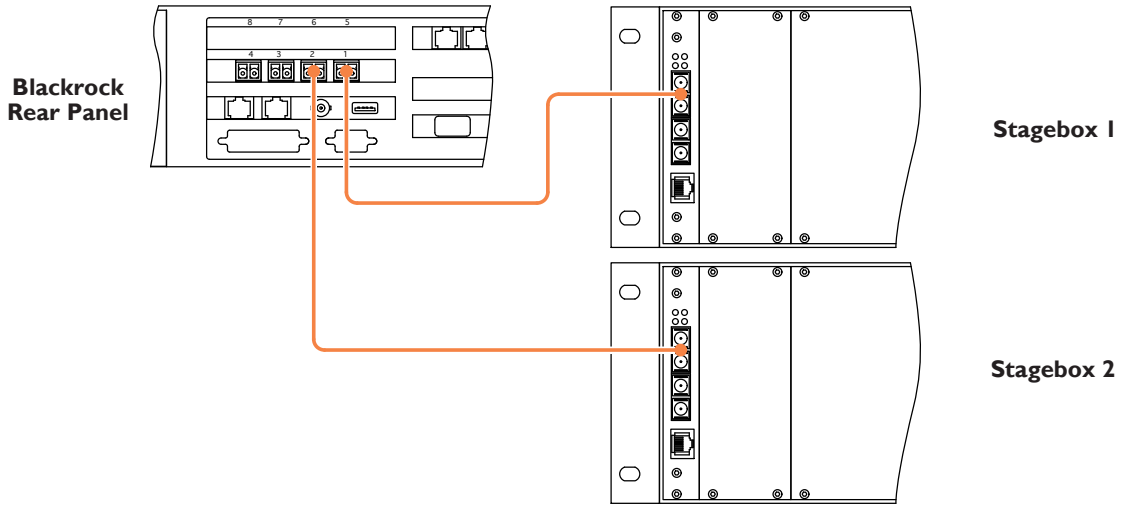
c. The '0' level LED 2 should flash.
   This indicates that the unit is in its channel-ID setup mode. (If either the '10' or '16' LEDs is lit instead then press the 'INPUT' button once or twice until the '0' LED lights).

d. One of the '*+48v*' lights 3 will also be lit.
   This indicates the current channel ID number.

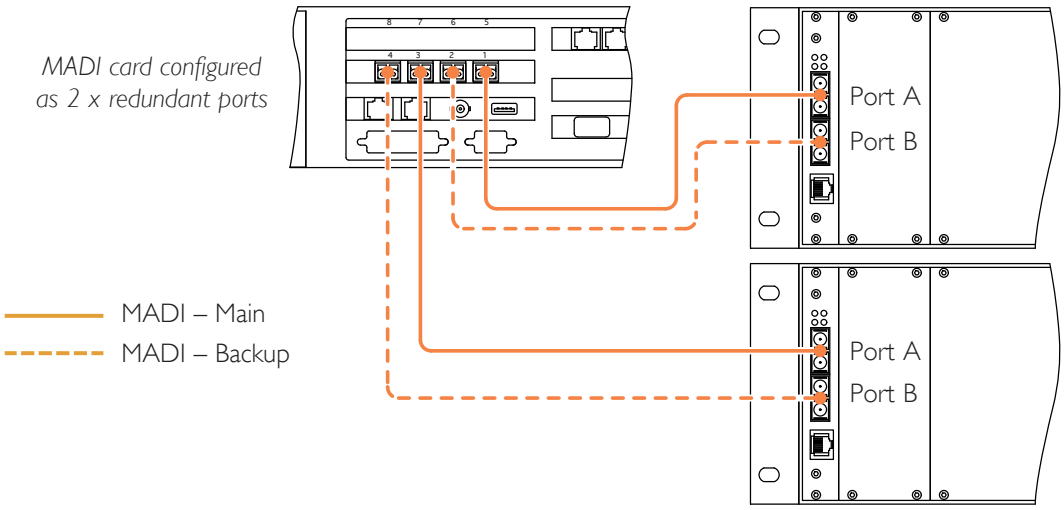
e. To alter the current channel ID number press the 'UP' or 'DOWN' buttons 4 on the front panel until the required channel is indicated.
   NB. It is possible to set channel numbers above ID3. Settings ID4 and above are invalid and will result in a loss of control of the unit.

f. Press the 'TYPE' and 'GAIN switches down together for about 1 second.
   This will exit the configuration mode. Remember to reconnect the control lead.

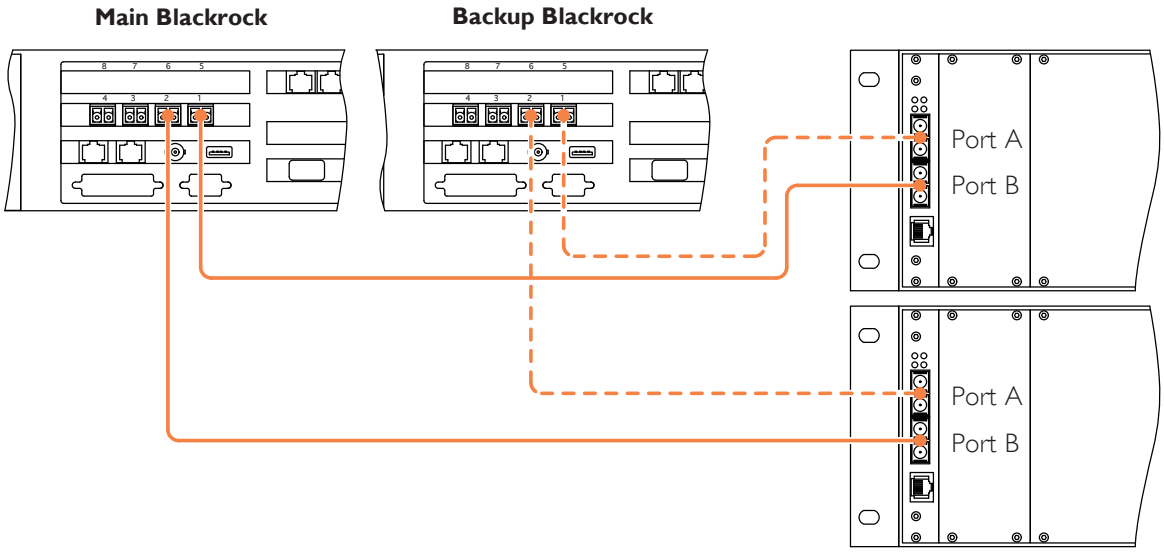
Fibre Connections – Single MADI



Fibre Connections – Link Redundancy



Fibre Connections – Link plus Processor Redundancy



MORSE Stageboxes

The information following applied to stageboxes that are directly connected to the Blackrock processor(s) without the MORSE router.

The MORSE router can be assembled and configured in different ways to suit specific requirements for resource sharing and redundancy. Systems that include a router will be individually tailored and then commissioned by SSL engineers so are not covered by this document.

Refer to page 4-10 for the connector pinouts.

Fibre Cables

2m fibre cables are supplied with each 3U stagebox which can be used for initial testing or if the units are adjacent to the Blackrock processor.

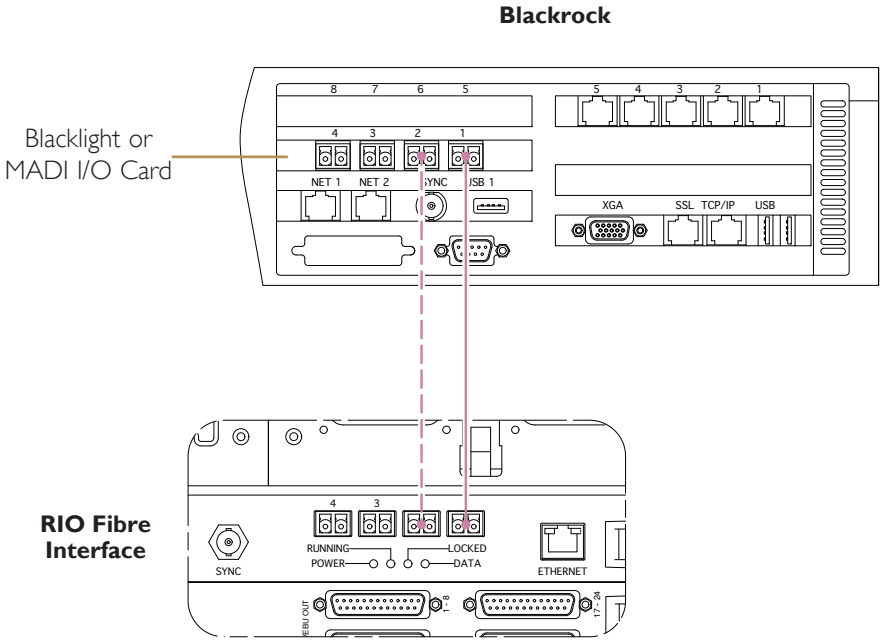
It is the responsibility of the facility or system integrator to supply longer fibre cables that may be necessary to allow the Alpha-Link units to be remotely located.

Each unit will require one or two fibre cable runs depending on the method of connection to the Blackrock. The diagrams opposite show the different connection arrangements.

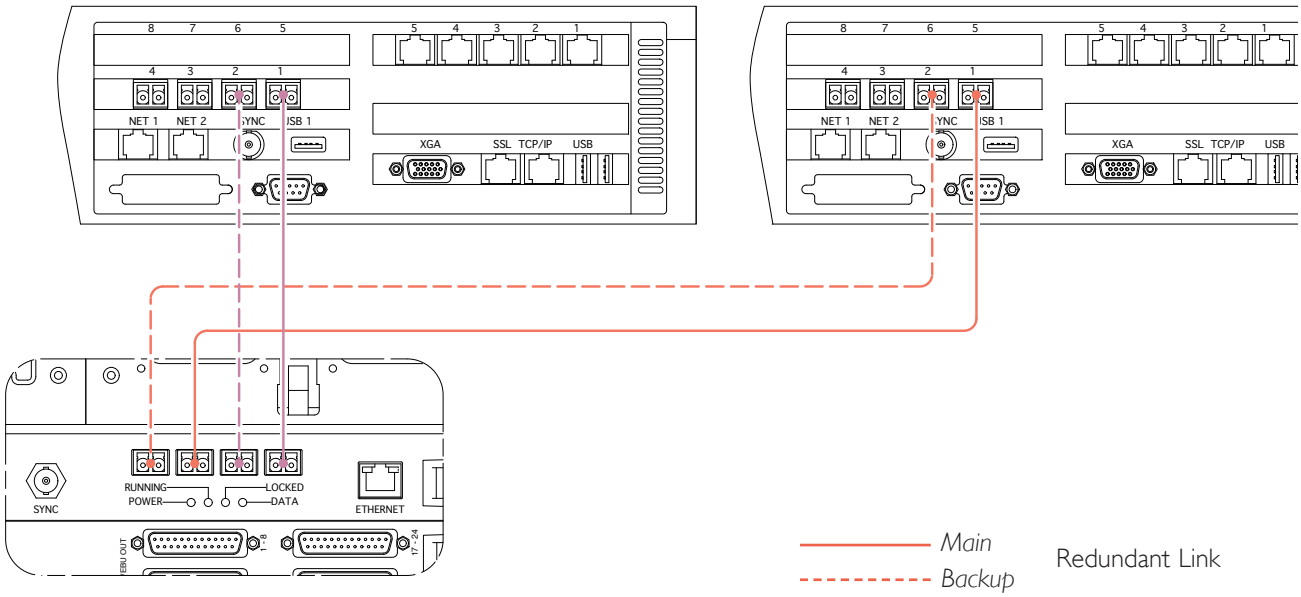
- When connecting to redundant Blackrock processors the main processor should be connected to input 'B' of each stagebox and the backup processor connected to input 'A'.
- Standard interface specification is: 50/125µm, multimode, duplex LC (at the Blackrock) to SC (at the stagebox).
- Singlemode versions of the stagebox MADI interface card can be specified at the time of order.
- It is recommended that spare cables are installed to remotely located units to allow for possible damage or future expansion.

Suitable ready made fibre cables are available from networking and computer supply outlets.

RIO Fibre Connection – Single Blackrock



RIO Fibre Connection – Redundant Blackrock



RIO Connection

Fibre Links

The Blackrock processor is supplied with four MADI ports as standard but may be expanded to provide eight ports (as shown opposite). The RIO unit is always equipped with four ports.

Connections between the Blackrock and RIO units are made using standard duplex LC – LC fibre cable assemblies. Default multiplexers are multimode standard. Suitable fibre cables are widely available from cable suppliers.

> *Singlemode fibre multiplexers can be specified for the Blackrock and RIO as a cost option. These will require matching singlemode connectors and cable assemblies. Refer to page 2-9 for additional information..*

RIOs that feature a ***Blacklight*** interface can support up to 256 channels per fibre link. Note that Blacklight links function as a main-plus-redundant pair – the second fibre acts as a backup to the first link.

MADI equipped RIOs provide 62 channels on the first fibre link and 64 channels for each subsequent lead. MADI interfaces may also be configured to operate as redundant pairs. The maximum channel count for MADI systems that require fibre redundancy is therefore 126 channels with a single processor and 62 channels with redundant processors.

> *Blackrock-to-RIO MADI interface ports operate as either four-individual OR two-redundant-pairs. It is not possible to operate one pair and two individual ports.*

Up to four RIO units can be connected to a Blackrock processor.

GP IO

The RIO Interface card is equipped with 24 circuits of GPI I/O. Inputs are fitted with 25-pin D-type male connectors. Outputs are 25-pin D-type female connectors. Mating connector kits are available to order. Both the input and the output circuits are fully isolated from the RIO electronics.

Outputs

All output switch closures are via DIL relay – the contact rating is 100Vdc, 125Vac, 100mA max. Do not use these outputs to directly switch capacitive or reactive loads; always use a separate external relay with suitable contact rating.

Inputs

Inputs are is triggered by applying an AC or DC voltage of between 4V and 30V between each pair of contacts. The current drawn is approximately 10mA. A voltage suitable for the input trigger is available on the output connectors and a 0V reference is provided on the input connectors.

The input and output signals can be either latching or momentary; this is individually assigned in software using the touch screen. When set to momentary, the input signal trigger duration must be greater than 50mS.

> *When used for discrete track arming with associated tally, the tally must return to the same number input as the arming output signal, (ie. the tally for GPI Out 1 will be on GPI In 1).*

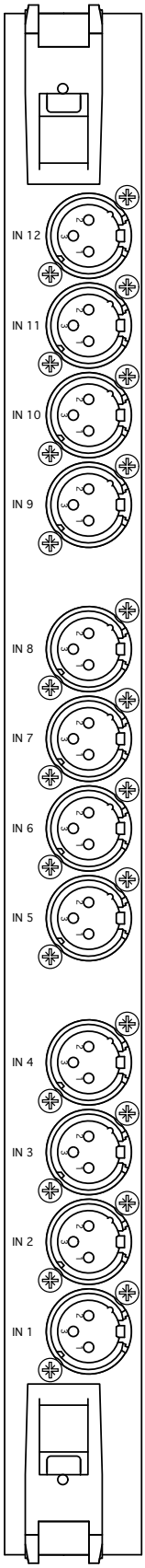
Sync Output

The '*Sync*' connector fitted to the front of the RIO interface card provides an output of Wordclock at the system's clock rate.

Ethernet

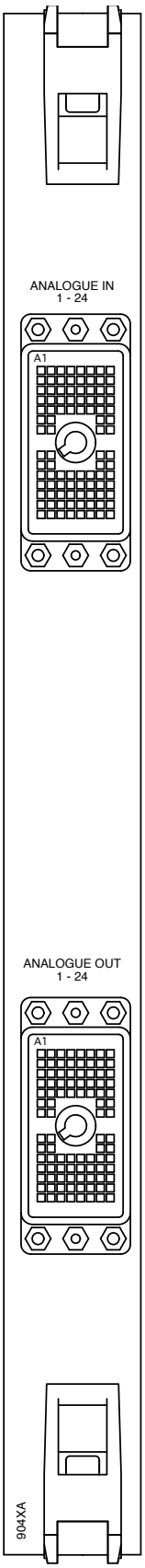
The Ethernet connector on the RIO interface card is non functional so must not be connected.

MICROPHONE INPUT



XLR3 Female

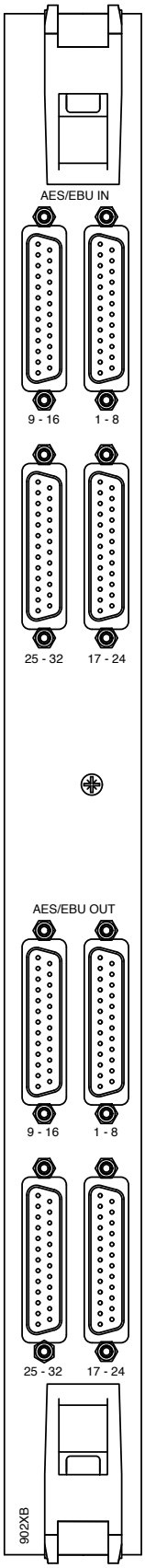
ANALOGUE I/O



DL96 Female

DL96 Female

DIGITAL I/O



D25 Female

D25 Female

RIO I/O Cards

Five I/O slots are available into which a range of input/output cards can be fitted. Any unused slots must always be fitted with blank panels (supplied) to assist the correct airflow through the rack.

Note that when assigning output channels to be insert sends, the console's routing system will automatically assign the same input channel number to be the corresponding insert return. It is therefore necessary to physically wire outboard equipment so that circuit allocation follows this arrangement.

MiCamp Card

The microphone input card provides 12 input channels accessible via standard XLR 3-pin female connectors.

The card has been specifically designed to operate in a broadcast environment and meets recognised performance standards. The card is fitted with RF input filtering, a high-speed analogue limiter and features high input CMRR.

⚠ *It is strongly recommended that the 48V phantom power is switched OFF (via the console control surface) before connecting microphones.*

Analogue I/O Card

The analogue card features 24 channels of balanced line-level input and output. The connectors used for input and output are Canon DL96 types. Mating connector kits and a contact crimp tool can be supplied (as cost options).

The default line-up level for analogue I/O is 0dBFS = +18dBu. This level may be adjusted in discrete steps that range from +9dBu to +24dBu to match the standard operating level for the facility.

i *Connector pinouts are listed on page 4-10.*

Digital I/O Card

The digital I/O card features 64 channels (32 AES/EBU pairs) of digital input and output. Sample rate conversion is available on every input so the card can accept input sample rates from 32kHz to 96kHz. The connectors are all D-25 type females and mating connectors can be supplied (as a cost option).

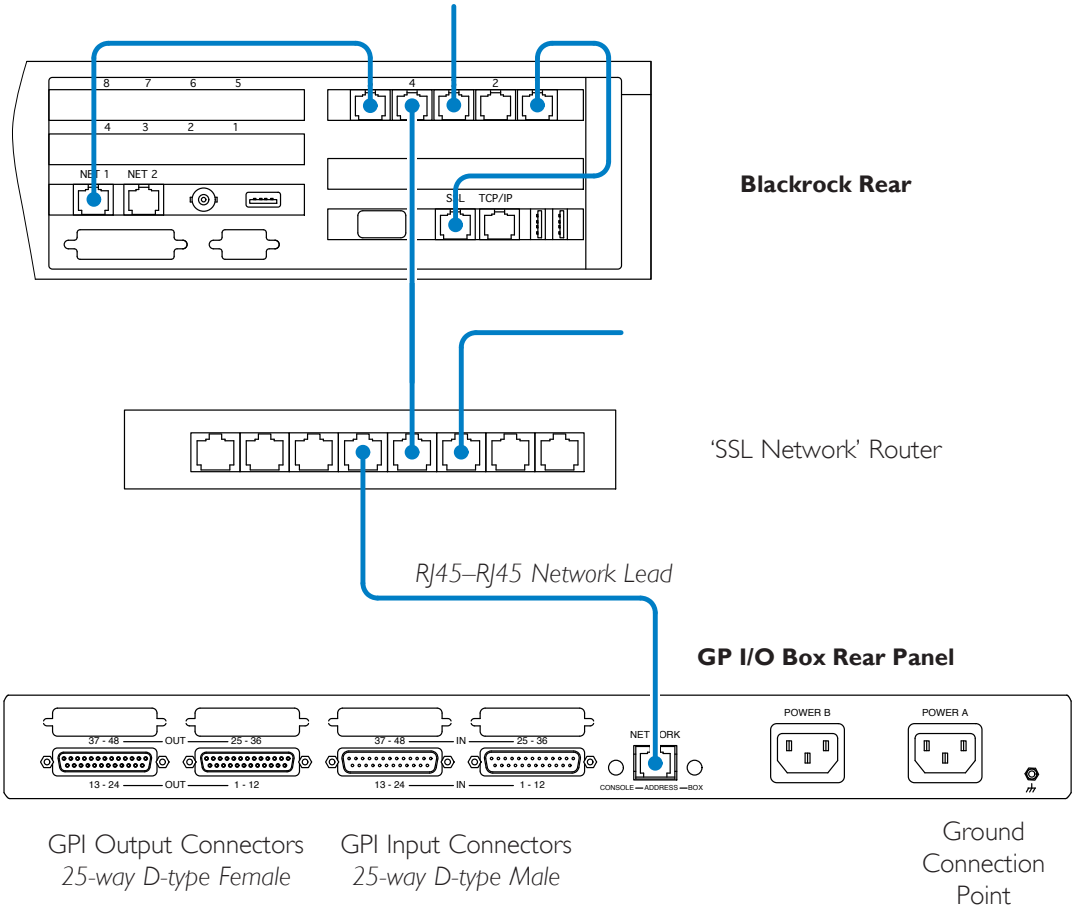
Two versions of the card are available: 110Ω and 75Ω. The 110Ω card features fully balanced output signals whereas the 75Ω card is unbalanced for correct matching to coaxial cables.

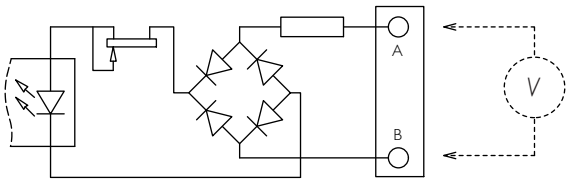
A 2U BNC breakout panel is available to interface with the 75Ω card. This panel converts the I/O card's D-25 connectors to chassis BNC plugs and can be ordered with 1m or 3m interconnecting leads.

Do not attempt to extend the panel interface leads beyond the 3m maximum; the signals are unbalanced and doing so could increase the risk of data corruption.

i *Connector pinouts are listed on page 4-10.*

GP IO – Console Connectors





Input Circuit

The input is triggered by applying an AC or DC voltage of between 4V and 30V. The current drawn is approximately 10mA.

Remote GP IO Box

The GP IO Box is available with either 24 or 48 I/O circuits. Inputs are 25-pin D-type male connectors. Outputs are 25-pin D-type female connectors. Mating connector kits are available to order. Both the input and the output circuits are fully isolated from the RIO electronics and power supply.

Refer to page 4-13 for the connector pinouts.

Outputs

Output switch closures are via DIL relay – the contact rating is 100Vdc, 125Vac, 100mA max. Do not use these outputs to directly switch capacitive or reactive loads; always use a separate external relay with suitable contact rating.

If used for discrete track arming with an associated tally, the tally must return to the same number input as the arming output signal, (ie. the tally for GPI Out 1 will be on GPI In 1).

Inputs

Inputs are is triggered by applying an AC or DC voltage of between 4V and 30V between each pair of contacts. The current drawn is approximately 10mA. A supply voltage suitable for the input trigger is available on the output connectors and a return 0V reference is provided on the input connectors.

The input and output signals can be either latching or momentary; this is individually assigned in software using the touch screen. When set to momentary, the input signal trigger duration must be greater than 50mS.

Network Connection

Installation simply requires that the unit be added into the existing ***SSL Network*** using an Ethernet cable. The connection must be made directly to the Blackrock or the SSL Network hub and not via any other network.

Chassis Ground

The internal mains power supplies are of the fully isolated type. It is recommended that a separate earthed lead is attached to the rear of the chassis and connected to a permanent nearby ground connection. An M3 threaded insert is provided on the rear panel for the ground lead.

Address Selection Switches

The default '*BOX*' switch setting for the initial GP IO unit is '*1*'. If a second unit is connected to the same console network then the address switch if the second unit will need to be set to position '2' – and so on for each additional unit up to a maximum of 15.

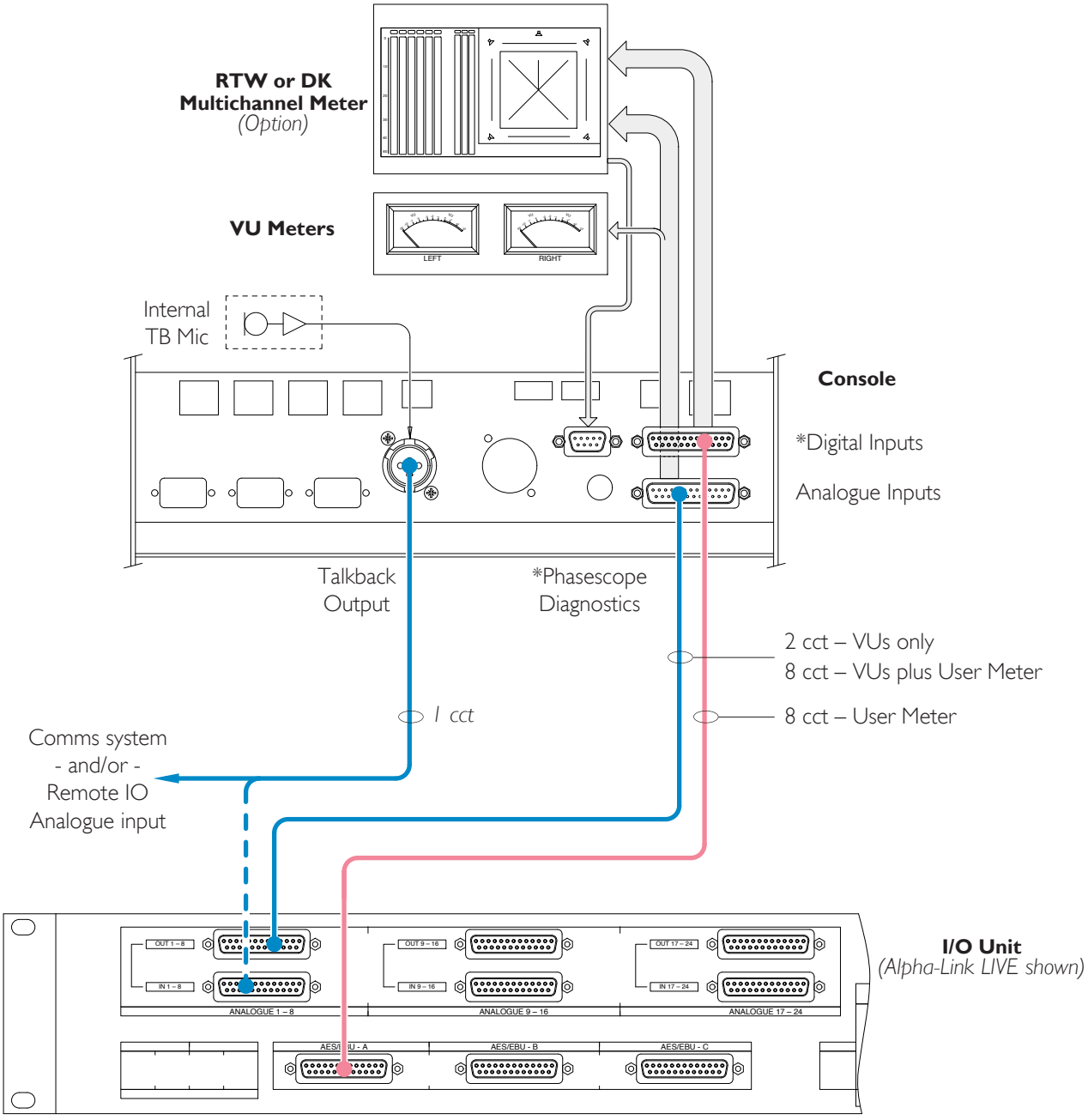
The '*CONSOLE*' switch will only require adjustment in installations where there will be more than one console connected to the same SSL network. The switch must be set to the same position as the console ID switch (located beneath the centre control tile) in order for the console to communicate with a GP IO box. The default setting of both ID switches is 1. It is not possible for two consoles to share control of the same IO unit.

Indicators

STATUS LED	
State	*Indication*
Flashing quickly	Ethernet activity
Flashing slowly	Network not connected

POWER LED	
State	*Indication*
Steady illumination	Both PSUs powered
Flashing slowly	One PSU powered

TALKBACK SYSTEM



Balanced Analogue Cable

110R Digital Cable

** Connectors fitted only when a phasescope has been specified*

Metering and Talkback

Refer to pages 4-7 and 4-8 for the connector pinouts.

VU Meters

The C100 HDS console is fitted with two analogue moving-coil VU meters. Inputs are line level, balanced.

- The analogue inputs to the meters are accessed via a ***25-pin D-type male*** connector.
- Two circuits should be allocated on an I/O unit and wired to the input connector using balanced cable.

Multichannel User Meter

The space above the VU meters in the master section can be fitted with an LCD user meter. Two meter types are available to order: The DK Technologies MSD600M++ Audio Analyser or the RTW TM7 Touchscreen SurroundMonitor. Both meters include loudness monitoring as standard.

The MSD600M meter is equipped with 8 digital inputs (4 AES/EBU pairs)* plus a port for serial diagnostics.

The RTW TM7 is equipped with 8 digital inputs (4 AES/EBU pairs with loop-through outputs), 8 analogue inputs plus a remote-control port. Note that the Left and Right analogue input channels also feed the left and right VU meters.

- The phasescope analogue (and VU meter) inputs are accessed via the ***25-pin D-type male*** connector.
- The phasescope digital inputs are accessed via the ***25-pin D-type female*** connector.
- Cable connections to the meters and multichannel monitor will need to be run between an I/O unit and the console – both balanced analogue and 110R digital cables may need to be installed depending on the chosen signals being monitored.
- The signals used to feed the meters could be paralleled from the console main output busses or independent feeds from the appropriate output card. Cabling should be installed and terminated prior to commencement of the console commissioning.

The D25 female for digital inputs and the D9 female diagnostics connectors are only fitted if a multichannel meter has been specified. The D25 male connector for analogue inputs is always fitted as it is used to feed the standard VU meters.

** The MSD600M has slots at its rear into which a range of input and output interface cards can be fitted. Cards are available in different combinations of analogue and digital I/O so some customisation is possible – please discuss individual requirements with SSL's Project Engineering Department prior to order. Note that some combinations of I/O cannot be accommodated due to limited connector availability.*

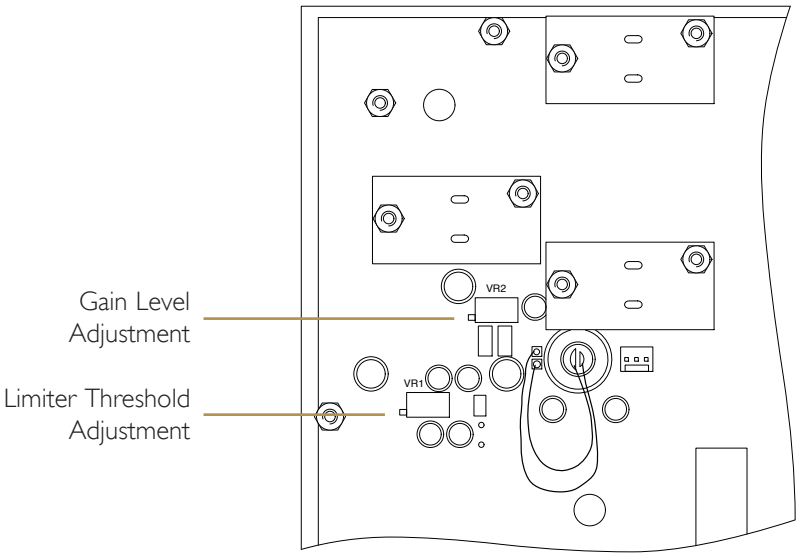
Talkback

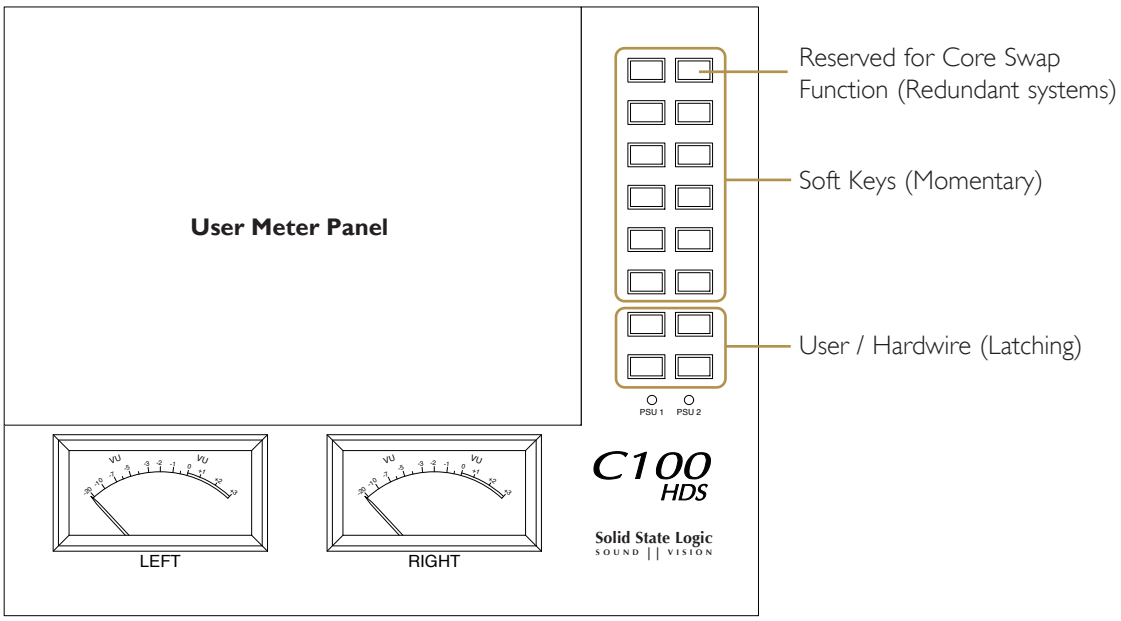
The C100 HDS console contains an in-built talkback microphone and amplifier. The microphone is located next to the main monitor level pot on the centre-control tile. The output is balanced and at line level (approximately 0dB) and the circuit features an inbuilt compressor. *See following page for TB gain adjustment information.*

- The TB output signal is provided on an ***XLR 3-pin male*** connector fitted to the console connector panel.
- Install a single balanced audio cable between the Talkback Output XLR and the facility's comms system and/or an analogue input circuit on an I/O unit (RIO or Alpha-Link LIVE). The input circuit number chosen can then be assigned as the talkback source via the console touchscreen.

Continued…

Rear of Centre Master Tile





Console Meters and Switch Panel

Talkback Level

The talkback microphone level is factory adjusted to provide an output level of approximately 0dBu during typical speech volume. The input gain of a comms system should be adjusted to match this level.

If adjustment of the console output level is necessary then presets for microphone gain and limiter threshold are available on the rear of the master controls panel (the panel above the fader tile in the centre section).

Note that the compressor threshold may need to be increased – by turning preset VR1 clockwise – BEFORE attempting to increase the amplifier gain, VR2.

Oscillator

The C100 HDS provides an inbuilt software oscillator. The oscillator signal can be assigned to any console output without the need for external cabling.

Alternatively, external hardware oscillators (either analogue or digital, mono, stereo or 5.1) may be supplied. In this configuration one or more circuits should be allocated on the appropriate analogue or digital input connector; these signals can then be allocated as the oscillator inputs via the touchscreen.

User Option / Soft-Key Switches

The meter panel is fitted with 16 switches which are available for user defined functions.

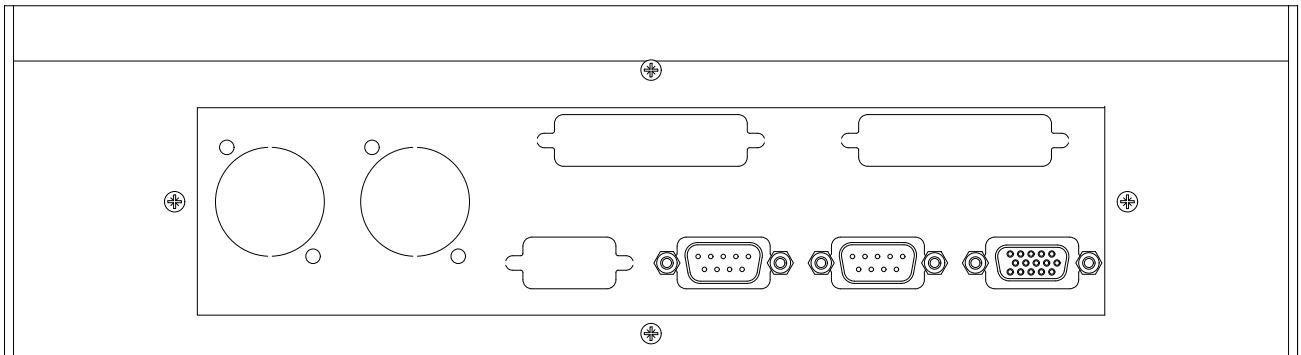
The switches are linked to the console's macro system so that each switch can be assigned to a range of internal console functions. They can also be programmed to operate a relay closure on the RIO or GP IO boxes.

Note that the upper right macro switch will be used to initiate the core swap function on systems that feature redundant processing.

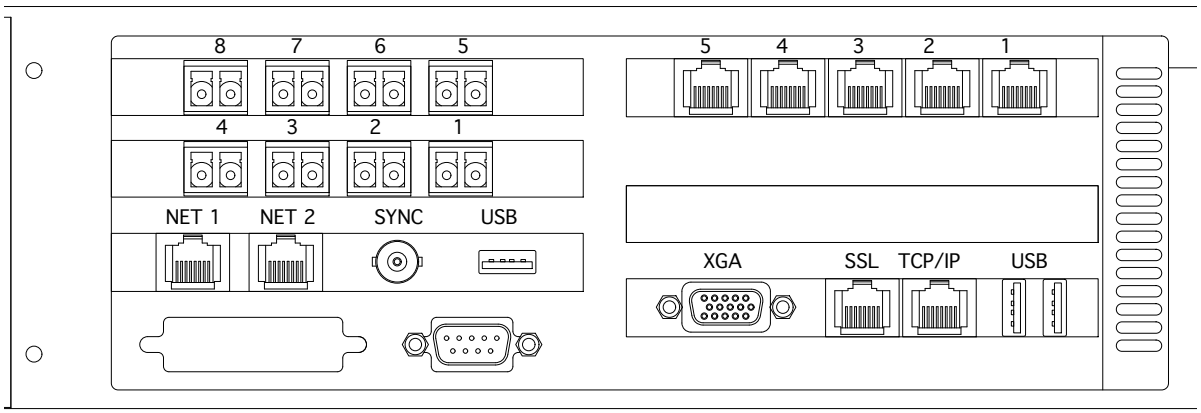
The lower four positions are fitted with physically latching switches. This enables them to be used for internal switching functions such as external TFT input switching.

Custom engraving for user option switches can be arranged – contact SSL's Project Engineering Department for details.

Console



Blackrock



Serial Port

RS422 Serial Ports – Automation/Router Data

Two serial control services are available on C100 HDS systems:

1. Router name transfer using the Probel PB08 protocol.
2. Remote control automation using the Sony ELC or Ross Overdrive protocols. *An license upgrade is required to activate the Automation feature.*

Refer to Appendix G of the Operators Manual for further details of the Automation feature.

It will be necessary to install appropriate cabling between the console/Blackrock and the remote equipment. The serial ports are located as follows:

- Two serial ports are provided on the console surface – the connectors are located on the additional connector panel. Note that the console includes internal switching so that the serial ports will automatically become redundant on systems that feature dual Blackrock processors.
- A single serial port located on the rear of the Blackrock chassis. This port is not redundant. If it becomes necessary to swap processor then the serial cable would have to be removed from the main processor and relocated to the backup unit.

Either serial service can be assigned to any of the three physical serial connectors. The port allocations are stored in system text files which can entered via the touchscreen terminal.

Serial Port File Allocation	
Physical Port	*Software Identification*
Console Serial Port 1	12
Console Serial Port 2	13
Blackrock(s) Serial Port	1

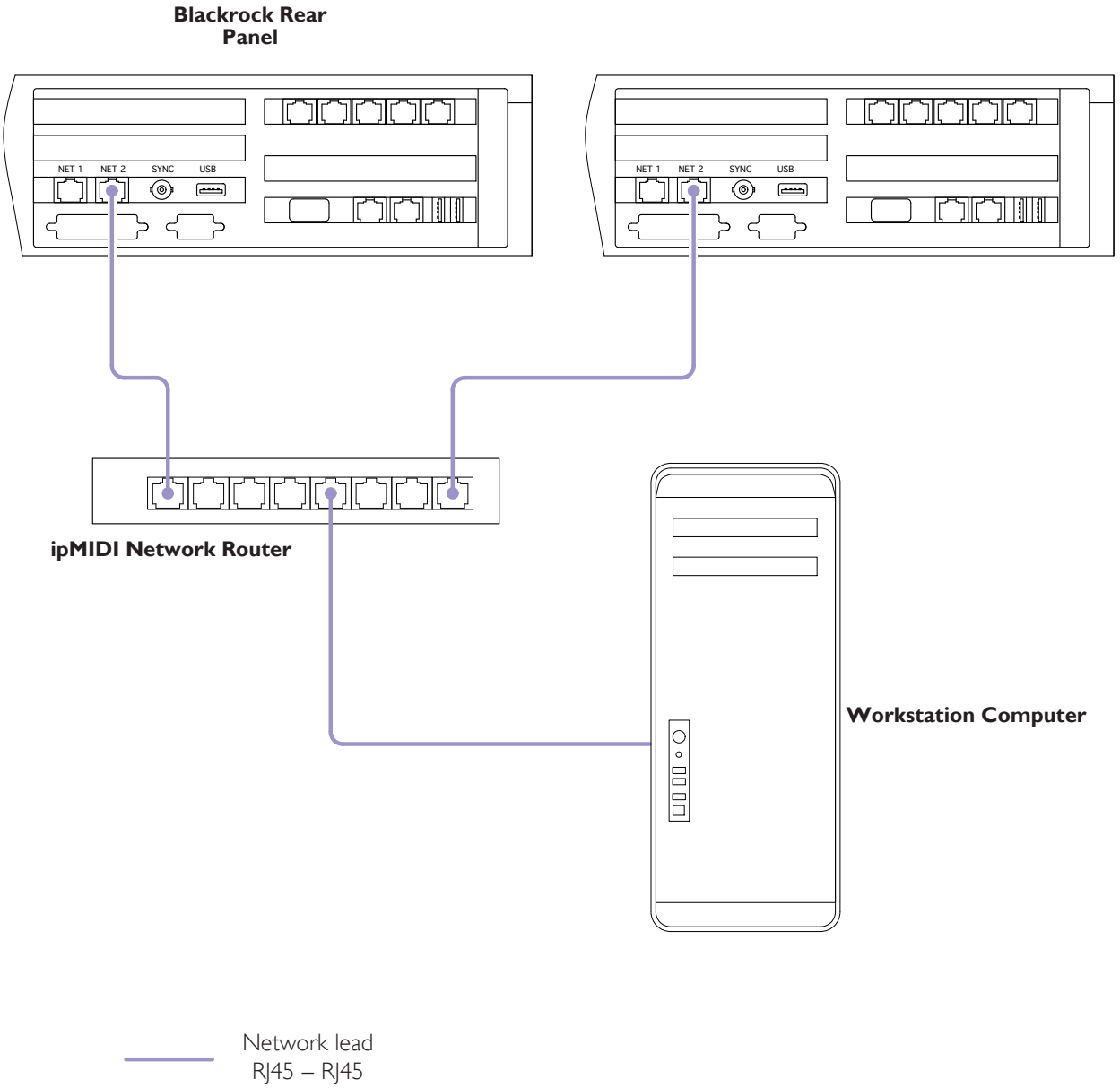
Touchscreen Video Output

A duplicate of the centre section touch-screen image is available on an XGA connector beneath the console. The connector is located on the additional connector panel; pinout follows standard HD-15 VGA.

Please note that the image output is in ***portrait*** orientation, not landscape, so an external monitor will need to be able to rotate by 90°.

Image specification is 1024 x 768 @ 60Hz,

IPMIDI NETWORK CONNECTIONS



ipMIDI

The C100 HDS console is able to communicate with a DAW directly via Ethernet.

To use the interface a third party ipMIDI software driver will need to be installed on the DAW computer. Using this method of communication allows the C100 HDS to be used with a wide variety of DAW applications on a number of different platforms. The C100 HDS uses a 'HUI' compatible protocol.

Please refer to your DAW manual for details on how to configure the DAW application for C100 HDS under HUI control.

Installing The ipMIDI Driver

Download to your Macintosh workstation computer the *IP_MIDI_MAC* disk image. This folder contains the latest version of the ipMIDI applications and includes installation instructions.

The file is downloadable from the SSL website using the following URL (towards the bottom of the page):

http://www.solid-state-logic.com/support/Consoles/C%20Series/downloads.asp

For PC software downloads please e-mail: support@solidstatelogic.com

Network Connection

The console features a dedicated ipMIDI connector '***NET 2***' for linking to DAW controllers, as shown opposite. The ipMIDI must not be connected to the SSL console network but may be linked via an existing TCP/IP network – see note below.

For single console/DAW installations where the workstation computer is located near console a single direct Ethernet connection may be used.

The ipMIDI data may also be connected to the workstation computer via a local IP network. Note, however, that ipMIDI implementation uses is a multicast UDP protocol which can increase the network traffic. On larger systems it may be of advantage to configure the facility's network routers to block the ipMIDI data from destinations other than the DAW computer. ipMIDI's UDP multicast group address is 225.0.0.37.

Notes

SECTION 4 – APPENDICES

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Main Index

SPECIFICATIONS

C100 HDS Console				
Parameter	*Condition*	*Value*	*Unit*	*Notes*
Height	To top of meter trim	1,006	mm	
Height adjustment		-0 +10	mm	
Width	32 channel without side trim 8 channel bay (add/subtract) Contoured side trims	1,431 285 +72	mm mm mm	 *Add 36mm each side*
Depth		926	mm	*Additional 18mm for heatsinks*
Weight	32 channel console with two legs 8 channel bay (add/subtract) Additional Leg	123 26 6.5	kg kg kg	*Approximately* " "
Heat Dissipation	32 channels 8 channel bay (add/subtract)	400 80	W W	*Approximately* "
Voltage	Range	100 – 240	V	*±10%, AC only*
Current	32ch max. over voltage range 48ch max. over voltage range	3.2 – 1.3 5.1 – 1.9	A A	
Power Factor		0.95		*Approximately*
Fusing	No user-accessible fuses			
Noise	Fanless			
Connectors	Power in Main/Backup Network TCP/IP USB (touchscreen) Meter input Analogue Meter input Digital T/B audio output	IEC 3-pin male 10A RJ45 100 baseT USB A 25-way D-type male 25-way D-type female XLR 3-way male		

Blackrock Processor

Parameter	*Condition*	*Value*	*Unit*	*Notes*
Height		2 89	U mm	
Width	 Case only without rack ears	19 449	in mm	
Depth		429	mm	*Excludes connectors/cables*
Weight (†)		14	kg	
Heat Dissipation		200	W	*Shared between two PSUs*
Voltage	Range	100 – 240	V	*±10%, 50/60Hz AC only*
Current	Maximum over voltage range	2.1 – 0.9	A	*Maximum*
Power Factor		0.95		*Approximately*
Fusing	Thermal current trip. No fuses			
Noise	Front Rear	50 55	NR NR	*Both PSUs powered* *Both PSUs powered*
Connectors	Power in 1 and 2 Networks Sync In Fibre I/O	IEC male RJ45 BNC 75Ω Duplex LC		 *Multimode or singlemode to order*

† *Blackrock processor units must be supported on rack shelves. Do not rely on the rack ears alone.*

RIO

Parameter	*Condition*	*Value*	*Unit*	*Notes*
Height		7 665	U mm	
Width	 Case only without rack ears	19 449	in mm	
Depth		344	mm	*Excludes connectors/cables*
Weight (†)		17 – 21	kg	*Depending on I/O fitted*
Heat Dissipation	5 Mic cards 1 Mic, 2 analogue, 1 digital card	500 350	W W	*Maximum* *Typical*
Voltage	Range	100 – 240	V	*±10%, AC only*
Current	Maximum over voltage range	5.6 – 2.3	A	
Power Factor		0.95		*Approximately*
Fusing	Thermal current trip. No fuses			
Noise	Front Rear	45 – 55 45 – 60	NR NR	*Variable speed fans*
Connectors	Power in 1 and 2 Network Sync out Madi 1–4 GPI Input GPI Output	IEC male RJ45 100 baseT BNC 75Ω Duplex LC fibre multimode 25-way D-type male 25-way D-type female		 *(unused)* *(Wordclock)*

† *RIO units must be supported on rack shelves. Do not rely on the rack ears alone.*

Alpha-Link Live/Live-R

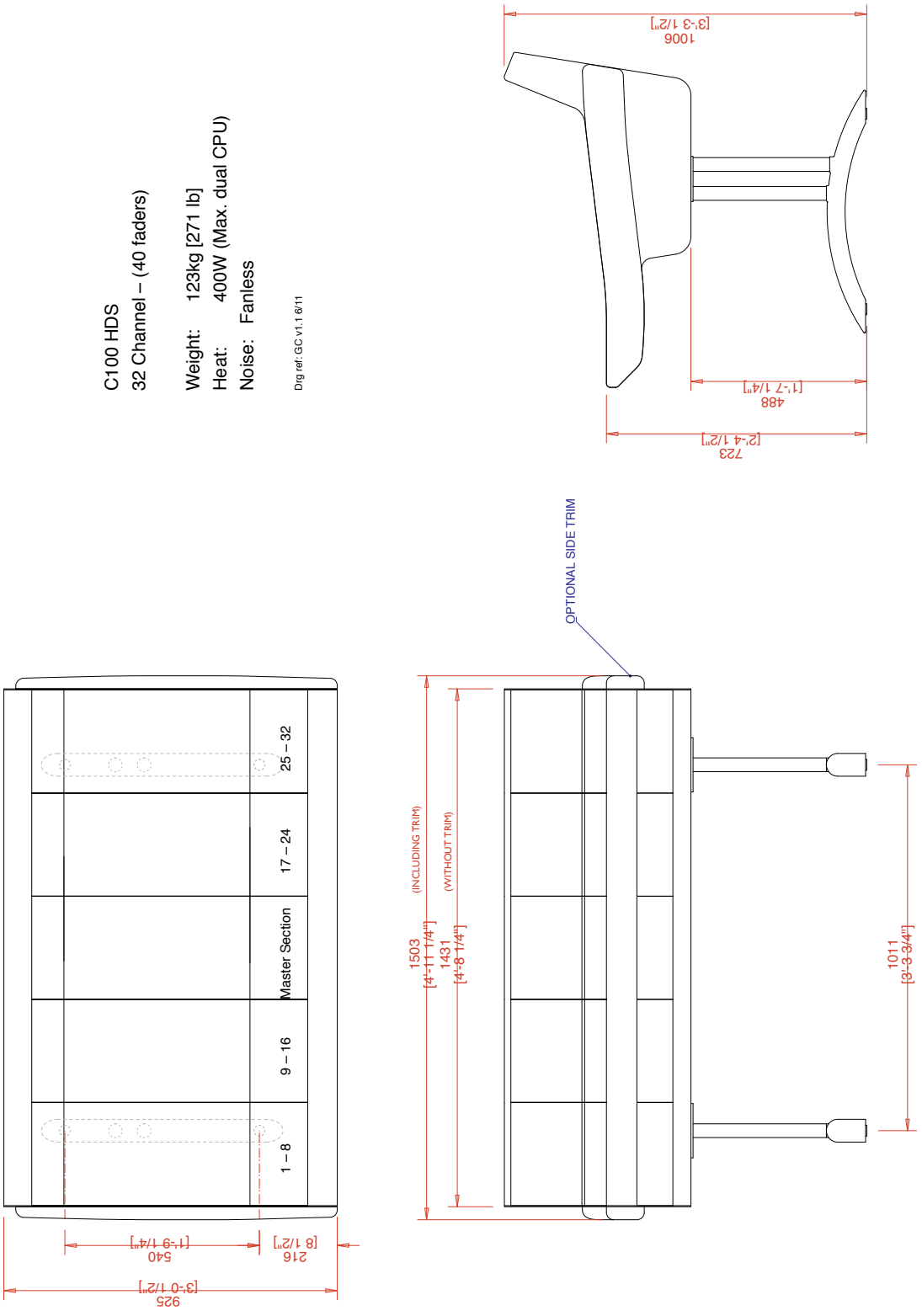
Parameter	*Condition*	*Value*	*Unit*	*Notes*
Height		2 89	U mm	
Width	 Case only without rack ears	19 449	in mm	
Depth		300	mm	*Excludes connectors/cables*
Weight (†)		6.0	kg	
Heat Dissipation		50	W	*Shared between two PSUs*
Voltage	Range	100 – 240	V	*±10%, 50/60Hz AC only*
Current	Maximum over voltage range	0.6 – 0.3	A	*Maximum*
Power Factor		0.95		*Approximately*
Fusing	Thermal current trip. No fuses			
Connectors	Power in 1 and 2	IEC male		
	Analogue Inputs	25-way D-type female		
	Analogue Outputs	25-way D-type female		
	Digital input/output	25-way D-type female		
	Video In (Sync)	BNC 75Ω		
	Word Clock Out	BNC 75Ω		
	MADI input/output	Duplex SC fibre socket		
	Remote mic control	RJ45 socket		

Alpha-Link 8-RMP

Parameter	*Condition*	*Value*	*Unit*	*Notes*
Height		2 89	U mm	
Width	 Case only without rack ears	19 449	in mm	
Depth		300	mm	*Excludes connectors/cables*
Weight (†)		6.0	kg	
Heat Dissipation		50	W	*Shared between two PSUs*
Voltage	Range	100 – 240	V	*±10%, 50/60Hz AC only*
Current	Maximum over voltage range	0.6 – 0.3	A	*Maximum*
Power Factor		0.95		*Approximately*
Fusing	Thermal current trip. No fuses			
Connectors	Power in 1 and 2	IEC male		
	Microphone Inputs	XLR 3-pin female		
	Line level Output	25-way D-type female		
	Remote control	RJ45 socket		

† Alpha-Link units must be supported on rack shelves. Do not rely on the rack ears alone.

CONSOLE FOOTPRINT DRAWING – 32 CHANNELS



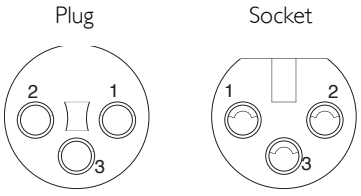
Connector Details

XLR 3-Pin

Dimensions: 19 x 60mm (approx.)
Cable Dia: 8-12mm (typical)

Pinout for balanced audio:

Pin 1	Screen/Ground
Pin 2	Hot (+ve)
Pin 3	Cold (-ve)



Connectors Viewed From Wiring Side

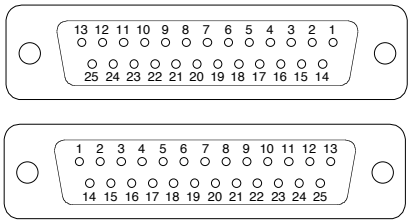
D-Type Multipin

25-way

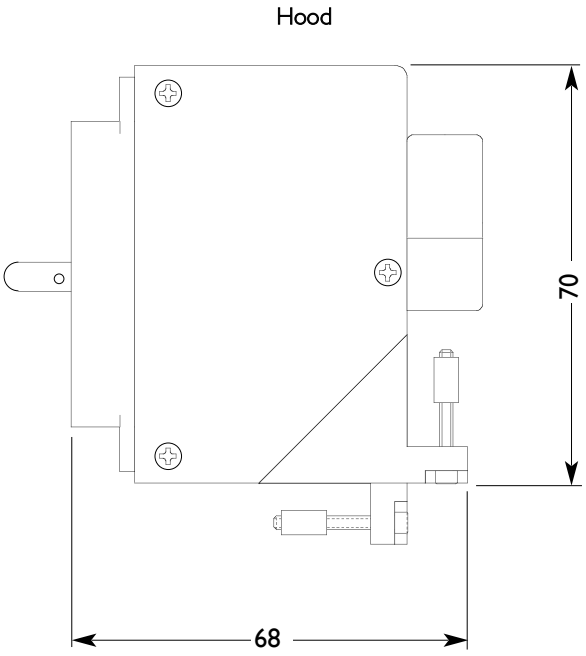
Dimensions: 55 x 15mm (approx.)
Cable Dia: 8mm (typical)

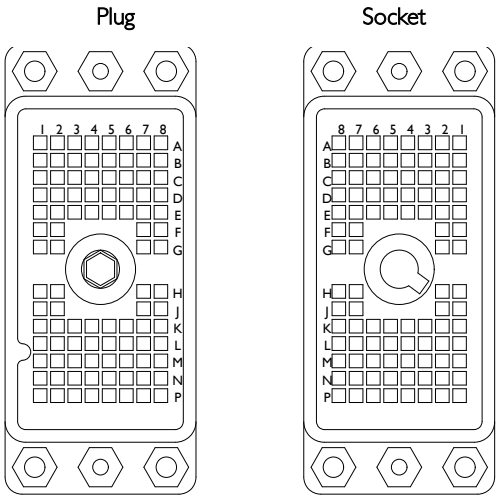
Screwlock thread: 440-UNC

Connectors Viewed From Wiring Side



DL 96-Pin – Used on the RIO unit Analogue I/O card





Connectors Viewed From Wiring Side

Dimensions: 29mm x 69mm

Connector Pinouts

C100 HDS Console

TB Out		
Location:	Console Connector Panel	
Connector Type:	XLR 3-pin male	
Pin	*Description*	*Notes:*
1	Chassis (screen)	
2	+ signal	
3	– signal	

Meter Inputs – Analogue				
Location:	Console Connector Panel			
Connector Type:	25-way D-type male			
Pin	*Description*		*VU Meters Only*	*With RTW TM7*
1	Circuit 1 input	+	Left VU meter	Input 1
14	Circuit 1 input	-		*And Left VU meter*
2	-			
15	Circuit 2 input	+	-	Input 2
3	Circuit 2 input	-		
16	-			
4	Circuit 3 input	+	Right VU meter	Input 3
17	Circuit 3 input	-		*And Right VU meter*
5	-			
18	Circuit 4 input	+	-	Input 4
6	Circuit 4 input	-		
19	-			
7	Circuit 5 input	+	-	Input 5
20	Circuit 5 input	-		
8	-			
21	Circuit 6 input	+	-	Input 6
9	Circuit 6 input	-		
22	-			
10	Circuit 7 input	+	-	Input 7
23	Circuit 7 input	-		
11	-			
24	Circuit 8 input	+	-	Input 8
12	Circuit 8 input	-		
25	-			
13	-			

C100 HDS Console

Meter Inputs – Digital*			
Location:	Console Connector Panel		
Connector Type:	25-way D-type female		
Pin	*Description*	*MSD600M*	*RTW TM7*
1	Circuit 1 +	-	AES/EBU out 7/8
14	Circuit 1 -		
2	-		
15	Circuit 2 +	-	AES/EBU out 5/6
3	Circuit 2 -		
16	-		
4	Circuit 3 +	-	AES/EBU out 3/4
17	Circuit 3 -		
5	-		
18	Circuit 4 +	-	AES/EBU out 1/2
6	Circuit 4 -		
19	-		
7	Circuit 5 +	AES/EBU in 7/8	AES/EBU in 7/8
20	Circuit 5 -		
8	-		
21	Circuit 6 +	AES/EBU in 5/6	AES/EBU in 5/6
9	Circuit 6 -		
22	-		
10	Circuit 7 +	AES/EBU in 3/4	AES/EBU in 3/4
23	Circuit 7 -		
11	-		
24	Circuit 8 +	AES/EBU in 1/2	AES/EBU in 1/2
12	Circuit 8 -		
25	-		
13	-		

Meter Diagnostics/Control*			
Location:	Connector panel		
Connector Type:	9-way D-type female		
Pin		*Notes: MSD600*	*Notes: RTW10830*
1		Chassis	Switch common
6		-	Mode
2		Rx Data	Select
7		-	Memo
3		Tx Data	Gain
8		-	Reset
4		-	Shift
9		-	-
5		-	-

** The Digital Input and Diagnostics connectors will only be fitted if an LCD meter has been specified.*

C100 HDS Console

RS422 Serial 1 and 2		
Location:	Console Additional Connector Panel	
Connector Type:	9-way D-type Male	
Pin	*Description*	*Notes*
1	Chassis	
2	TX–	
3	RX+	
4	0V	
5	nc	*No connection*
6	0V	
7	TX+	
8	RX–	
9	Chassis	

Blackrock Processor

RS422 Serial		
Location:	Blackrock Rear Panel	
Connector Type:	9-way D-type Male	
Pin	*Description*	*Notes*
1	n/c	*'Controller' Pinout …*
2	RX-	
3	TX+	
4	n/c	
5	0V	
6	n/c	
7	RX+	
8	TX-	
9	n/c	

RIO – Analogue and Digital I/O

Analogue In / Out

Location:	944 Analogue Card
Connector Type:	DL96 female

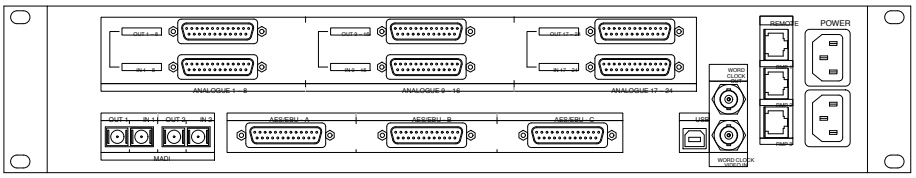
Cct	*Hot*	*Cold*	*Screen*	*Notes*
1	A1	B1	C1	*All other pins unused*
2	A2	B2	C2	
3	A3	B3	C3	
4	A4	B4	C4	
5	A5	B5	C5	
6	A6	B6	C6	
7	A7	B7	C7	
8	A8	B8	C8	
9	D1	E1	F1	
10	D2	E2	F2	
11	D3	E3	G1	
12	D4	E4	G2	
13	D5	E5	G7	
14	D6	E6	G8	
15	D7	E7	F7	
16	D8	E8	F8	
17	L1	K1	J1	
18	L2	K2	J2	
19	L3	K3	H1	
20	L4	K4	H2	
21	L5	K5	H7	
22	L6	K6	H8	
23	L7	K7	J7	
24	L8	K8	J8	

AES/EBU In and Out 1–8 (9–16, 17–24, 25–32)

Location:	942 DIO Card
Connector Type:	25-way D-type female

Cct	*Hot*	*Cold*	*Screen*	*Notes*
1	24	12	25	*Pin 13 unused*
2	10	23	11	
3	21	9	22	
4	7	20	8	
5	18	6	19	
6	4	17	5	
7	15	3	16	
8	1	14	2	

ALPHA-LINK LIVE-R



Analogue Input/Output 1–8 (9–16, 17–24)

Location:	Alpha-Link Live rear panel
Connector Type:	25-way D-type female

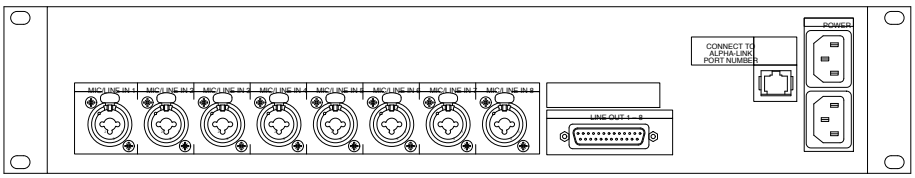
Cct	*Hot*	*Cold*	*Screen*	*Notes*
1	24	12	25	*Pin 13 unused*
2	10	23	11	
3	21	9	22	
4	7	20	8	
5	18	6	19	
6	4	17	5	
7	15	3	16	
8	1	14	2	

AES/EBU Inputs/Outputs A,B,C (1–8, 9–16, 17–24)

Location:	Alpha-Link Live Rear Panel
Connector Type:	25-way D-type female

Pin	*Description*	*Notes:*
1	Out channels 7/8 +	*Outputs*
14	Out channels 7/8 -	
2	Ground	
15	Out channels 5/6 +	
3	Out channels 5/6 -	
16	Ground	
4	Out channels 3/4 +	
17	Out channels 3/4 -	
5	Ground	
18	Out channels 1/2 +	
6	Out channels 1/2 -	
19	Ground	
7	In channels 7/8 +	*Inputs*
20	In channels 7/8 -	
8	Ground	
21	In channels 5/6 +	
9	In channels 5/6 -	
22	Ground	
10	In channels 3/4 +	
23	In channels 3/4 -	
11	Ground	
24	In channels 1/2 +	
12	In channels 1/2 -	
25	Ground	
13	-	

ALPHA-LINK 8-RMP



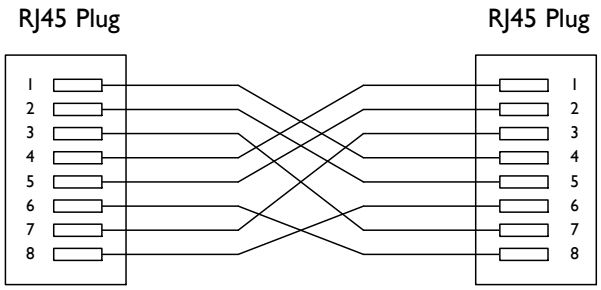
Microphone Inputs 1–12

Location:	Alpha-Link 8-RMP Rear panel	
Connector Type:	XLR 3-pin female	
Pin	*Description*	*Notes:*
1	Ground	
2	+ signal	
3	– signal	

Analogue Output 1–8

Location:	Alpha-Link 8-RMP rear panel			
Connector Type:	25-way D-type female			
Cct	*Hot*	*Cold*	*Screen*	*Notes*
1	24	12	25	*Pin 13 unused*
2	10	23	11	
3	21	9	22	
4	7	20	8	
5	18	6	19	
6	4	17	5	
7	15	3	16	
8	1	14	2	

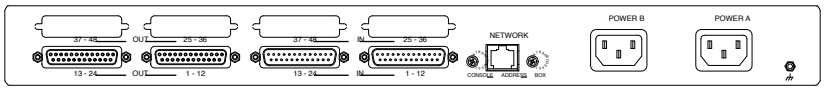
ALPHA-LINK LIVE TO ALPHA-LINK 8-RMP CONTROL CABLE PINOUT*



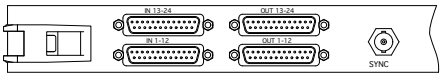
**Applicable to Alpha-Link Live only. Alpha-Link Live-R can use pin-pin Ethernet compatible cables*

GP IO

Remote GP IO Box



RIO GP IO



GP Inputs		
Location:	Rear Panel	
Connector Type:	25-way D-type male	
Pin	*Description*	*Notes:*
1	Input 1A	
14	Input 1B	
2	Input 2A	
15	Input 2B	
3	Input 3A	
16	Input 3B	
4	Input 4A	
17	Input 4B	
5	Input 5A	
18	Input 5B	
6	Input 6A	
19	Input 6B	
7	Input 7A	
20	Input 7B	
8	Input 8A	
21	Input 8B	
9	Input 9A	
22	Input 9B	
10	Input 10A	
23	Input 10B	
11	Input 11A	
24	Input 11B	
12	Input 12A	
25	Input 12B	
13	0V	

GPI Outputs		
Location:	Rear Panel	
Connector Type:	25-way D-type female	
Pin	*Description*	*Notes:*
1	Output 1A	
14	Output 1B	
2	Output 2A	
15	Output 2B	
3	Output 3A	
16	Output 3B	
4	Output 4A	
17	Output 4B	
5	Output 5A	
18	Output 5B	
6	Output 6A	
19	Output 6B	
7	Output 7A	
20	Output 7B	
8	Output 8A	
21	Output 8B	
9	Output 9A	
22	Output 9B	
10	Output 10A	
23	Output 10B	
11	Output 11A	
24	Output 11B	
12	Output 12A	
25	Output 12B	
13	+12V	*450mA maximum*

AUDIO INTERFACING

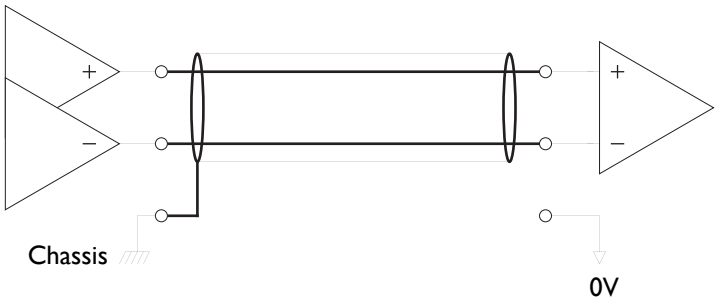
All analogue audio inputs and outputs are electronically balanced. The screen pins are all directly connected to the chassis at the point of entry to comply with AES/EBU grounding and EMC recommendations.

BALANCED CIRCUITS

It is strongly recommended that balanced connections are used wherever possible using high quality screened cable. The following diagram shows the recommended connection with both screens connected to the chassis:

Balanced – Balanced
Both screens connected to chassis
(Recommended)

On some older items of equipment the screen connection may still be referenced to the circuit 0V point rather than the chassis. In these cases it may be advantageous to disconnect the screen at this connection. Note however that this practice will degrade the EMC performance.

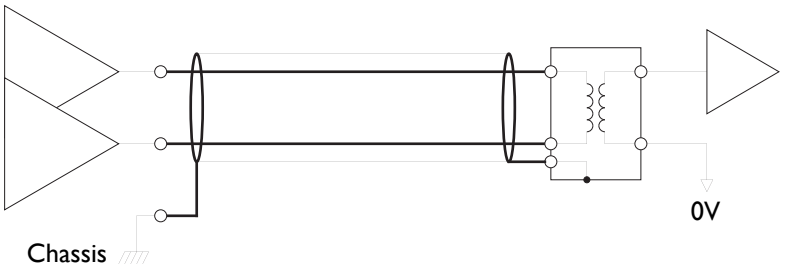


Balanced – Balanced
One screen connected to chassis

CONNECTING TO UNBALANCED EQUIPMENT

Connecting to unbalanced equipment can be much more problematic. It is quite likely that induced RF earth currents will become referenced to the audio 0V which will give rise to audible hum and buzz.

The recommendation for connection of balanced to unbalanced equipment is to isolate unbalanced connections by using a balancing transformer.



Balanced – Unbalanced
One screen connected to chassis
(Recommended)

Environmental Specification

Temperature	Operating:	5 to 30 Deg. C
	Non-operating:	-20 to 50 Deg. C
	Max. Gradient:	15 Deg. C/Hour
Relative Humidity	Operating:	20 to 80 %
	Non-operating:	5 to 90 %
	Max. wet bulb:	29 Deg. C (non-condensing)
Vibration	Operating:	< 0.2 G (3 - 100Hz.)
	Non-operating, power off:	< 0.4 G (3 - 100Hz.)
Shock	Operating:	< 2 G (10mSec. Max.)
	Non-operating:	< 10 G (10mSec. Max.)
Altitude (Above sea level)	Operating:	0 to 3000 m
	Non-operating:	0 to 12000 m

Notes Relating to Static and Air Conditioning

- Any item of electronic equipment can be affected by electrostatic discharge. It is considered good practice to avoid using fully insulating floor coverings in technical areas.
- Air conditioning will usually be required. Note however, that a cool and dry atmosphere can significantly increase the likelihood of a build-up of static charge. It is recommended that air conditioning systems are designed such that the relative humidity does not fall below 30% during periods of operation.

SUPPORTED SYNC RATES

Supported Sync Rates				
No.	Video Format	Field Rate (Hz)	Frame Rate (Hz)	*Notes*
1	PAL	50	25	*SD sync rates are suitable for all units*
2	PAL 24	48	24	
3	NTSC	59.94	29.97	
4	1080i 60Hz	60	30	*HD sync rates are only accepted by the Blackrock processors*
5	1080i 59.94Hz	59.94	29.97	
6	1080i 50Hz	50	25	
7	1080p 60Hz	60	60	
8	1080p 59.94Hz	59.94	59.94	
9	1080p 50Hz	50	50	
10	1080p 30Hz	30	30	
11	1080p 29.97Hz	29.97	29.97	
12	1080p 25Hz	25	25	
13	1080p 24Hz	24	24	
14	1080p 23.976Hz	23.967	23.967	
15	1080PsF 24Hz(1080i 48Hz)	24	24	
16	1080PsF 23.976Hz(1080i 47.95Hz)	23.967	23.967	
17	720p 60Hz	60	60	
18	720p 59.94Hz	59.94	59.94	
19	720p 50Hz	50	50	

UNSUPPORTED RATES

PAL 23.976

720p 30Hz

720p 29.97Hz

720p 25Hz

720p 24Hz

720p 23.976Hz

SNMP

SNMP (Simple Network Management Protocol) is a generic network management structure that can be applied to any networked appliance for which remote or distributed monitoring is required. In a typical SNMP configuration, there will be a number of systems to be managed or monitored and one or more additional systems present to manage them. A prerequisite for this is that all monitored appliances must be accessible via an Ethernet network in some way.

In the case of the C100 HDS system, the Blackrock DSP card, the console control surface and the RIO I/O unit are all systems which can be managed – access is facilitated by the SBC Linux processor. The system management function itself will be provided by a third party management system (or systems) – the SBC acts simply as an SNMP agent or bridge, communicating with the SSL system(s) and passing that information on via SNMP.

There are, at the time of writing, three 'versions' of SNMP, known simply as 'SNMPv1', 'SNMPv2' and 'SNMPv3'. The SBC at this time supports both versions 1 and 2 but not version 3. Each version of SNMP is an enhancement on the previous one where version 2 improves use and flexibility of the protocol whilst version 3 largely adds additional security features. There are at present no plans to implement SNMPv3.

How It Works

The SNMP agent application running on the SBC accepts SNMP requests from the management system and in turn requests the required information from the Blackrock DSP card across the SSL network connection. Responses from the Blackrock DSP card are interpreted by the SNMP agent and returned to the management system. For example, if the management system submits a request for the system software version, the agent application on the SBC will send the relevent Ethernet request to the Blackrock DSP card, interpret the response and respond to the management system with the temperature measurement as follows:

- The management system sends a '`GET object sslC110SoftwareVerString`' command.
- The SBC sends an matching SNMP request over Ethernet to the Blackrock DSP card.
- The SBC extracts the data from the response and sends it back to the management system.

SNMP Traps

By using an SNMP structure called a 'trap', an SNMP message can also be initiated by the agent application and sent to the network management system autonomously. This therefore means that the network management system does not have to continuously poll each agent for every possible status but will still be able to report on both major and minor issues. Using this structure therefore the SBC's agent application can flag – without receiving a request from the management system – significant error events such as DSP failures or a software crash.

Local Configuration

Configuration of what status information can be requested and which errors are flagged via a trap are defined in the SBC's 'Management Information Base' or MIB for short. This is located on the SBC and will be found in the /usr/share/snmp/mibs folder. There will be two MIB files found here; one for the Blackrock DSP card (and console) and one for the B-RIO. In addition to requesting status information, management systems can also set any objects that are defined as read/writeable in the MIB although in the C100 HDS implementation no parameters are set as writable – most of the objects defined in the MIBs, such as the power supply voltages, up-time, temperature etc. can't be written to anyway for what should be obvious reasons…

Communication between the management system, the SNMP agent and the Blackrock DSP card is all by reference to the relevent entry in the MIB files. It is therefore important that the management system has access to the correct MIB files for the version of system software that the C100 HDS is running. A full list of the MIB objects currently available will be found later in this section.

System Configuration

When setting up an SNMP system, the SNMP 'community' needs to be defined. A community is a group to which both the hosts running the SNMP service and the managed systems belong. The use of a community name provides some basic security and a reporting context for agents receiving requests and initiating traps – an SNMP agent will not respond to a request from a management system outside its configured community, nor will a management system act upon messages from an agent that is not within it's own set of communities.

Community configuration in the SBC is provided by the `'ssl_setup'` application (see page 3-9). Using this command line tool will allow the following to be configured:

`SNMP public community string`	This string is used for read-only SNMP '`get`' requests. By default this string will be set to '`public`'.
`SNMP private community string`	This string is used for read/write SNMP '`set`' requests. By default this string will be set to '`private`' (although at present C100 HDS has no writable SNMP objects).
`SNMP trap community string`	The trap community string defines the community that 'trap' events – such as a crash – are transmited to. The default entry for this is '`public`' although it can of course be partitioned into a seperate community if required.

In addition to the trap community string, the SBC will need to know the name of the computer receiving 'trap' messages:

`SNMP trap receiver computer name`	This is the hostname of the machine on which the management system receiving 'trap' messages is running. On a windows PC you can find this is in **Control Panel**, **System Info**, **Computer Name** – on a Macintosh this would be in **System Preferences**, **Sharing**, **Computer Name** whilst on a Linux system it would be the name return by `/bin/hostname`.

For the SBC to be able to communicate with the named receiver, the machine must be accessible by name; that means that either the machine's name and IP address must be present in the SBC's local hosts file (in the /etc folder) or details of both machines must be present in the local DNS ('Dynamic Name Server') – and both machines set to query the DNS.

In order for the management system to know what objects might be available, it will require copies of the MIB files. These can be copied from the `/usr/share/snmp/mibs` folder in the SBC.

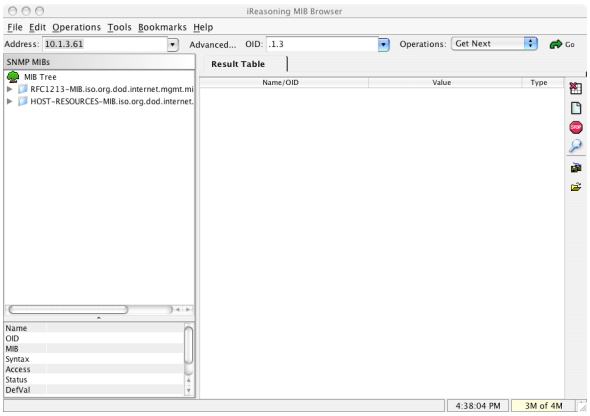
SNMP Management Systems

There are many management systems available, just two examples being Hewlett Packard's OpenView software and packages from iReasoning inc. The iReasoning packages are of interest as there are free versions of their MIB browser available which will run on Windows, Macintosh, Linux and other Unix platforms. Whilst this package is not licensed for commercial use and only allows you to browse SNMP traps and messages – not act upon them – it can be used to investigate what might be possible with a fully configured SNMP system.

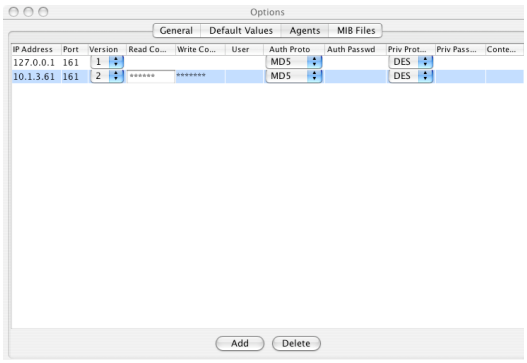
The following instructions show the basic steps necessary to get up and running with the free MIB browser from iReasoning.

It is assumed that the iReasoning MIB Browser package has been downloaded and installed on to a computer that already has network access to the SBC via the TCP/IP network.

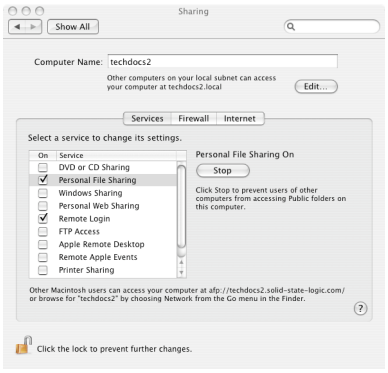
1. Launch the MIB Browser. In the top left-hand corner of the browser, enter the IP address of the Integration Computer that you wish to interrogate.



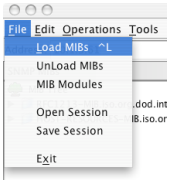
2. In **Tools**, **Options**, **Agents**, enter the read only ('public') and read/write ('private') community strings for your Integration Computer.



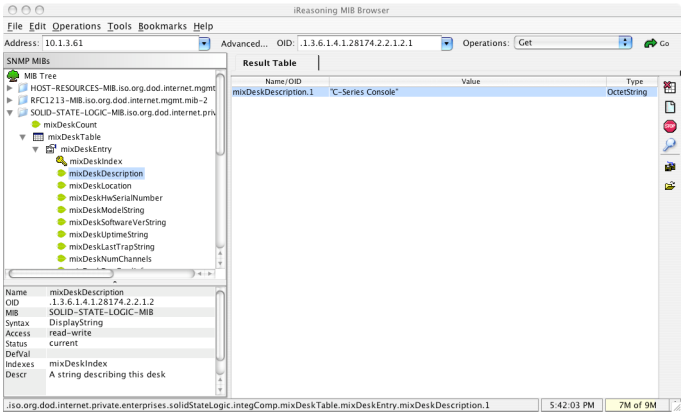
3. Identify your computer's hostname (network name) and, using the '**`SSL_setup`**' tool, set the SNMP trap receiver computer name to match this name. If you have a correctly configured local network, the SBC should be able to use this name to discover the IP address of the SNMP management system through the local DNS server. In the example shown here the name is 'techdocs2' and as will be clear, this is a Macintosh – Windows is similar with the information required residing under **Control Panel**, **System Info**, **Computer Name**.


Sharing
Show All
Computer Name: techdocs2
Other computers on your local subnet can access your computer at techdocs2.local
Edit...
Services
Firewall
Internet
Select a service to change its settings.
On
Service
DVD or CD Sharing
Personal File Sharing
Windows Sharing
Personal Web Sharing
Remote Login
FTP Access
Apple Remote Desktop
Remote Apple Events
Printer Sharing
Personal File Sharing On
Stop
Click Stop to prevent users of other computers from accessing Public folders on this computer.
Other Macintosh users can access your computer at afp://techdocs2.solid-state-logic.com/ or browse for "techdocs2" by choosing Network from the Go menu in the Finder.
Click the lock to prevent further changes.

4. Finally, use **Files**, **Load MIBs** to read in the C100 HDS MIB files. These files will be found on the SBC in the `/usr/share/snmp/mibs` folder. They will be called `SOLID-STATE-LOGIC-C110-MIB.txt` for the Blackrock DSP card and `SOLID-STATE-LOGIC-RIO-MIB.txt` for the B-RIO.



5. It will now be possible to browse the available data; right click on the objects in the SNMP MIBs list and by selecting '**Get**', you can obtain the value for the object. The example here shows the result for a `mixDeskDescriptionString GET` request. Where a request is for either a valid or an un-configured object for a connected system it should return more or less instantly with either the result or a failure message. If the remote system is not present there will be a timeout period before a failure is returned. Objects which are writable can be set in a similar way by right clicking on an object and selecting '**Set**' – in the resulting pop-up, enter the required value and click on **OK**.



6. Any traps received can be viewed by selecting **Tools**, **Trap Receiver**. Clicking on an individual trap will display its details in the bottom half of the window.

C100 HDS SNMP Objects

The individual SNMP objects for the C100 HDS (Blackrock) system that are exported from V1.1/5 software are as follows:

Object	Type	Description
`SSLC110Psu1Status`	read-only	The current status of Blackrock processor PSU 1
`SSLC110Psu2Status`	read-only	The current status of Blackrock processor PSU 2
`sslC110PsuFanStatus`	read-only	The current status of the Blackrock processor PSU fans
`SSLC110MainScreenGfx1Status`	read-only	The current status of the primary console TFT Meter driver
`SSLC110MainScreenGfx2Status`	read-only	The current status of the secondary console TFT Meter driver
`SSLC110SerialNumber`	read-only	The SSL network id. number of this Blackrock DSP card
`SSLC110ModelString`	read-only	String providing the model name of this system
`SSLC110SoftwareVerString`	read-only	String providing the system software version
`SSLC110UptimeString`	read-only	String providing the current uptime of this system
`SSLC110SyncStatusString`	read-only	String providing the sync status
`SSLC110NumChannels`	read-only	The number of channels currently available on this system
`SSLC110DspInfo`	read-only	The current status of this systems Blackrock DSP array
`SSLC110InRedundantPair`	read-only	A value representing the redundancy status if the system. Returns 'yes' if the system is part of a redundant pair
`SSLC110MasterInRedundantPair`	read-only	A value representing the master status of the system. Returns 'yes' if it is the system master of a redundant pair or 'no' if it is either a system slave or is not part of a redundant pair
`SSLC110ActiveConsoleInRedundantPair`	read-only	A value representing the active status of a system if it is part of a redundant pair. Returns 'yes' if it is the active system or 'no' if it is either inactive or not part of a redundant pair
`SSLC110DiskStatusString`	read-only	String providing the system disk (SMART) status
`SSLC110RaidStatusString`	read-only	String providing the disk RAID status

C100 HDS SNMP Traps

The standard 'trap' objects that are available for the C100 HDS system in V1.1/5 software are shown in the following table.

Object	From	Description
SSLC110Restarting	System	System restarting
SSLC110MemLow	System	Blackrock DSP card memory low
SSLC110DspReboot	System	A DSP device on the Blackrock DSP card has rebooted
SSLC110DspRebootFail	System	A DSP device on the Blackrock DSP card has failed to reboot
SSLC110Psu1Fail	Processor	Blackrock processor PSU 1 failure
SSLC110Psu2Fail	Processor	Blackrock processor PSU 2 failure
sslC110PsuFanFail	Processor	Blackrock processor fan failure
SSLC110MainGfx1Fail	Console	Primary console TFT meter driver failure
SSLC110MainGfx2Fail	Console	Secondary console TFT meter driver failure
SSLC110LostTileComms	System	Lost Ethernet communication to the control surface
SSLC110ResumedTileComms	System	Recovered Ethernet communication with the control surface
SSLC110Synclost	System	External (Video/AES) sync lost
SSLC110SyncReturned	System	External (Video/AES) sync recovered
SSLC110NowActiveInRedundantPair	System	Blackrock processor is now the active member of a redundant pair
SSLC110NowDormantInRedundantPair	System	Blackrock processor is now the dormant member of a redundant pair
SSLC110DiskStatusNotify	SBC	SBC system disk SMART status trap. This will be sent upon receiving a SMART error from the system hard disks
SSLC110RaidStatusNotify	SBC	SBC RAID disk array status trap. This will be sent upon receiving a change in status from the system RAID disk array manager

B-RIO SNMP Objects

The individual SNMP objects for B-RIO units that are exported from V1.1/5 software are as follows:

Object	Type	Description
sslRioIndex	read-only	The index of the B-RIO unit – up to 8 units may be connected and addressed
sslRioPresent	read-only	Indicates if a B-RIO unit is connected to the system
sslRioVersion	read-only	Carries the B-RIO firmware version string
sslRioTemp1	read-only	Temperature reading in degrees Celcius from the primary internal temperature sensor
sslRioTemp2	read-only	Temperature reading in degrees Celcius from secondary internal temperature sensor
sslRio1v2	read-only	Voltage reading from the +1.2V rail
sslRio3v3r1	read-only	Voltage reading from the +3V3 rail (primary sensor)
sslRio3v3r2	read-only	Voltage reading from the +3V3 rail (secondary sensor)
sslRio5v	read-only	Voltage reading from the +5V rail
sslRio5v5	read-only	Voltage reading from the +5V5 rail
sslRio15V	read-only	Voltage reading from the +15V rail
sslRioMinus15V	read-only	Voltage reading from the –15V rail
sslRioCardsInfo	read-only	A string providing details of which I/O cards are currently fitted to this B-RIO
SSLC110NowDormantInRedundantPair	System	Blackrock processor is now the dormant member of a redundant pair
SSLC110DiskStatusNotify	SBC	SBC system disk SMART status trap. This will be sent upon receiving a SMART error from the system hard disks
SSLC110RaidStatusNotify	SBC	SBC RAID disk array status trap. This will be sent upon receiving a change in status from the system RAID disk array manager

B-RIO SNMP Traps

The standard 'trap' objects that are available for B-RIO units in V1.1/5 software are as followings:

Object	From	Description
sslRioOnline	B-RIO	A B-RIO unit has come online
sslRioOffline	B-RIO	A B-RIO unit has gone offline
sslRioChassisFan1Fail	B-RIO	B-RIO chassis fan 1 failure
sslRioChassisFan2Fail	B-RIO	B-RIO chassis fan 2 failure
sslRioPsu1Fail	B-RIO	B-RIO PSU 1 failure
sslRioPsu2Fail	B-RIO	B-RIO PSU 2 failure
sslRioPsu1FanFail	B-RIO	B-RIO PSU 1 fan failure
sslRioPsu2FanFail	B-RIO	B-RIO PSU 2 fan failure

Further Information on SNMP

A great deal of information regarding SNMP is of course available from the internet whilst a highly recommended book is '*Essential SNMP, 2nd edition*', published by O'Reilly Media (ISBN10: 0-596-00840-6, ISBN13: 9780596008406).

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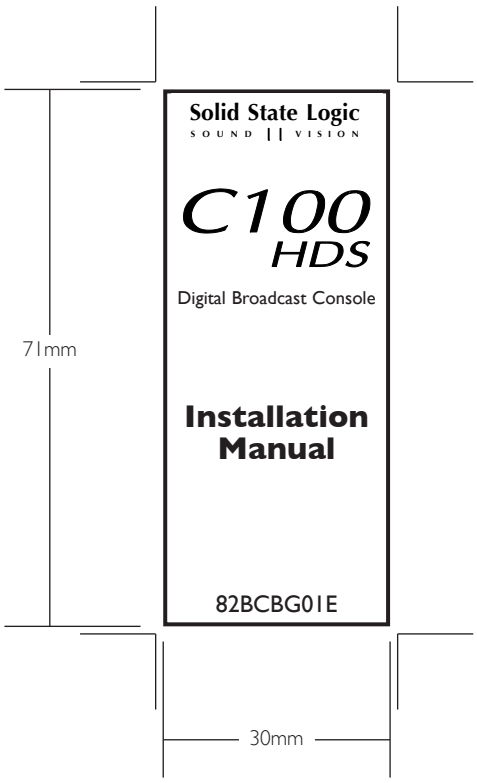
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HDS
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Installation
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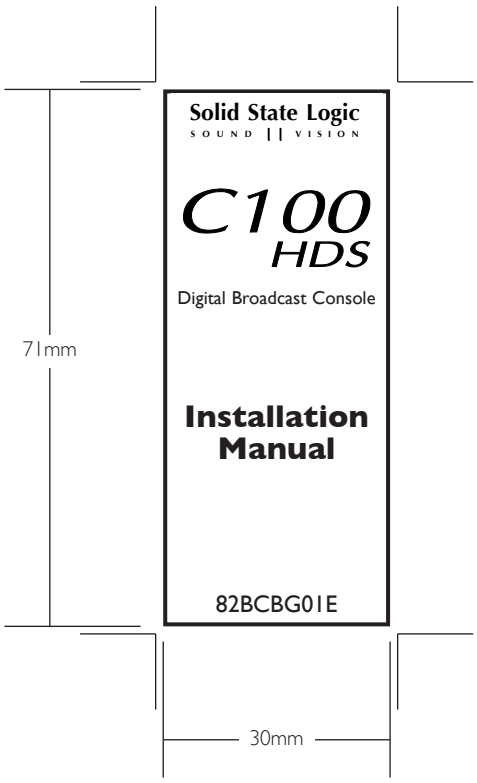
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